GAS JOURNAL

LIGHT ✂ HEAT ✂ POWER ✂ BYE-PRODUCTS

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Editorial Notes.

The Government Gas Bill.

An Earnest of Goodwill.

Upon the ark of the gas industry, forging ahead through deep waters oft troubled by the puff of the electricity propagandist, has alighted a dove in the form of the Earl of Lucan; and the olive leaf he bore from the Government is the draft of the Gas Undertakings Bill, 1929. The Bill received the first reading in the House of Lords on Tuesday, the 19th instant, and a second reading yesterday; and it is hoped by the Government, whose Bill it is, by the National Gas Council, who for nearly three years have laboured unremittingly to cast off the fetters of antiquated and anomalous legislation, and by the whole gas industry, that the measure may find its way on to the Statute Book with the minimum of contention and wasted time. Not that this happy event will constitute the end of the voyage; it cannot be too strongly emphasized that the present Bill should be regarded by the industry and by the public (who seem at last to have realized that gas is something very live and strong, and worthy of their interest) only as an earnest of Government goodwill—a port of call on the way to legislative emancipation along the lines framed by the National Gas Council in 1926, and endorsed practically in their entirety by the Second Report of the National Fuel and Power Committee [see "JOURNAL" for Jan. 16 last].

The Bill which we now welcome, and which will go some way towards removing the bitterness that spread far and fast through the industry and sections of the public last year, was foreshadowed in our issue of Dec. 26, 1928, when we remarked that a Bill framed—in view of the exigencies of Parliamentary time—to avoid discussion in the House must necessarily be an emasculated and fragmentary measure. Such it proves indeed to be, as the following review of its clauses shows.

The first clause gives power to the Board of Trade to make Orders increasing the authorized amount of share capital and of loans in the case of Company Undertakings. In the past all Company Undertakings seeking to increase their authorized capital have had to obtain the approval of both Houses of Parliament, and the procedure for obtaining this approval was both slow and costly—the expense of a Private Bill might amount to between £2000 and £3000. Other commercial undertakings can raise capital without seeking the sanction of anyone other than their shareholders; and although it is not proposed to accord the same measure of freedom to gas undertakings, the simplified procedure now proposed will prove beneficial and at the same time provide the necessary safeguards. Clause 2 provides that gas companies may borrow on mortgage of their undertaking, or by the creation and issue of debenture stock, any amount not exceeding one-half of the aggregate amount of the paid-up share capital for the time being. This power has already been obtained by a number of companies by means of Special Acts of Parliament or their equivalent; and it is satisfactory to note that it is now proposed to give a general power which can be exercised at any time without reference either to Parliament or to the Board of Trade. Clause 3 proposes to give powers to increase the authorized amount of Reserve Funds or of Special Purposes Funds, and will have the effect of enabling undertakings to approximate more closely to ordinary commercial practice.

Clause 4 provides that the Board of Trade may by Order authorize a gas undertaking to supply premises outside its limits, if there is no other undertaking's pipeline within twenty-five yards; but the consent of the undertaking within whose area the applicant premises are situated and of the local authority concerned must be obtained, unless unreasonably withheld. A power of this kind has long been enjoyed by the Electricity Supply Industry, being granted by what is known as a "Fringe Order," and there are many cases in which it will prove useful to gas undertakings. By Clause 5 it is proposed that gas undertakers supplying more than 20 millions a year shall, as from a day appointed by Order of the Board of Trade, charge for gas on the thermal instead of the volumetric system. This clause enables the Board of Trade to exercise a power which was accorded to them by the Gas Regulation Act. Clause 6 proposes to extend the Board of Trade's power to make Special Orders under the Gas Regulation Act, and is chiefly designed to enable a gas undertaking to supply gas in the area of another undertaking where the latter have failed to lay down or to provide mains during a period of five years from the date on which they obtained powers to do so. Clause 7 provides for certain minor amendments of the Gas Regulation Act, 1920, the most important of which (set out in the Schedule) adds a proviso to sub-section 3 of section 1 to the effect that the sub-section shall not operate in such a way as to deprive undertakers of any advantage which they would have obtained or to give them any advantage which they would not have obtained under their maximum or standard price as it existed before June 30, 1914, by reason of alteration in the efficiency of working or the annual output of the undertaking.

Short as the Bill is, and meagre as are its provisions compared with the "Act of Grace" which we have long awaited and which we can now anticipate with confidence, nevertheless there is a wealth of possibility wrapped-up in these few clauses; and the administrators of gas undertakings large and small will eagerly seek therein the chance of improving and consolidating their position. And meanwhile—to return to our opening metaphor—we can look forward to Ararat, where the industry will disembark and multiply exceedingly.

Vitality.

At a time, like last week, when records in the matter of gas consumption were being registered in all directions, and when the mercury was displaying its modesty by making strenuous efforts to hide itself, thus giving rise to troubles in unexpected places, it would have been unreasonable to look for a bumper attendance at the Joint Gas Conference held at Castle Bromwich, Birmingham. It was felt that very many who would have liked to be present would be forced to remain at home on duty, and that indisposition would keep others away. This proved to be the case; but in all the circumstances the audience which faced Mr. Frank H. Jones, M.Inst.C.E., as Chairman, was gratifying, and one that spoke well for the vitality of the industry.

It is fitting that conferences of this character should be arranged by the four great national organizations of the industry upon the occasion of the annual British Industries Fair; and the hope may be expressed that they will be continued as part of a vital national movement. The Gas Industries Section has become a highly important part of the Fair; and as the gas industry does not go back, it follows that this position will be maintained, if not improved upon. So good is the Gas Section on this occasion, that it affords further strong evidence of the vitality of an industry whose prosperity is essential to the well-being of the community. Such a display as is to be seen at Castle Bromwich must draw gas men in large numbers; so that the stage for a useful conference is already set. Who would not wish to take full advantage of such an opportunity? Even in an Ice Age such as we have lately been passing through, a conference of this character has been a proved success; and under more genial temperature conditions, still better results would doubtless accrue.

The programme last week proved to be an attractive one; and at the very commencement those who wondered what there could be to discuss in a paper on gasholders were greatly enlightened. The gasholder, in relation to the monetary value of other portions of gas-works plant, is far more important than a casual observer would imagine; and then, of course, there are gasholders and gasholders. If the types of gasholder continue to multiply at the present rate, one will be able to envisage a time when the engineer will be in as great a difficulty in making his choice as a lady is supposed to be when buying a hat. However, all that there is in a holder Mr. R. J. Milbourne, Assoc.M.Inst.C.E., can be trusted to get out of it. On an occasion not so very long ago we recall that he drew romance from gasholders; and we more than half suspect an endeavour on his part last week to draw beauty from them, too. The paper was enjoyed, and so was the discussion; and those who had listened to both left the meeting firmly convinced that, metaphorically as well as actually, there is more in a gasholder than meets the eye.

On the second day, Mr. Stephen Lacey, B.Sc., Assoc.M.Inst.C.E., was equally successful with inspection and maintenance. Nobody wonders what there is to be said about maintenance; for it is a subject which is always with us, and one which is appreciable from a number of angles. To give the most efficient service, gas must be consumed under the best conditions; and "under the best conditions" is only another term for "by means of properly maintained appliances." There is no argument as to the necessity of maintenance; the difference of opinion is with regard to the best method of carrying it out. The faulty or abused gas appliance is a dragon in the path of gas progress which must be removed at any cost; and Mr. Lacey was able to point to one way, at any rate, in which this is being done. Incidentally, we were pleased to note the emphasis laid in the course of the discussion upon the value of the lighting load. Our electrical friends may be assured that this load will as far as possible be retained, with all the tenacity of which the gas industry is capable. Anyone who doubts this should read the discussion upon Mr. Lacey's paper.

Much of the already mentioned success of the conference was due to the hospitality extended to the visitors on the part of the Fair Management Committee and various firms whose works were thrown open for the inspection of gas heated industrial appliances. These appliances, it may be added, fully came up to the expectations aroused by the lantern lecture in which they were described by Dr. C. M. Walter. We will merely say that the reception everywhere was just that which one is accustomed to associate with Birmingham and its neighbourhood.

An Occasion for Legitimate Pride.

As we "listened-in" to the speech of "our greatest Commercial Ambassador," H.R.H. the Prince of Wales, last Monday week at the Mansion House, and as we read the reports and articles and interviews in the Daily Press on the following days, we could not help feeling very proud to think that the stirring-up of public opinion on the subject of Salesmanship which has led first to the appointment of a Government Committee to investigate it on the side of education, and now to this endorsement of the campaign by the Prince, has been largely the work of the gas industry's chief salesman. Since Mr. Goodenough took the chair of the Incorporated Sales Managers' Association in the autumn of 1926, the subject has rapidly become a very live one. In July, 1927, at his invitation, two Cabinet Ministers—Sir Philip Cunliffe-Lister and Lord Eustace Percy—spoke at a Sales Managers' Conference at Olympia presided over by Viscount Burnham. In February, 1928, H.R.H. the Duke of York accepted the invitation of the Association to be their guest at their annual dinner, and aroused great public interest by a speech on the parallel between Salesmanship and Statesmanship. At the same dinner Lord Eustace Percy foreshadowed the appointment of a Government Committee. A few months later such a Committee was set up; and Mr. Goodenough was appointed its Chairman with very general approval. Now, in February, 1929, the Prince of Wales sounds his clarion call to industry at the Mansion House; and "Salesmanship" is the topic of the hour.

For a representative of the "moribund" gas industry, this is no mean achievement. Mr. Goodenough would be the first, we are sure, to say that the beginning is not the ending; that the task before his Committee is a difficult one; and that he would rather no one shouted while they are still in the wood. He would also, we can state of our personal knowledge, be the first to say that any credit is due to his Directors for giving him the opportunity to specialize on salesmanship, as an industry-wide problem, through his position as Chairman of the British Commercial Gas Association, and as a nation-wide problem, through his Chairmanship of the Sales Managers, followed now by his Chairmanship of the Government Committee. But opportunity is of little value unless good use be made of it; and it is on the results of his making fruitful use of his opportunities for service to the gas industry and the nation that we and all our readers are congratulating ourselves and Mr. Goodenough to-day.

An early opportunity of supporting by definite evidence the suggestion of the Prince that there is something wrong with our salesmanship abroad presented itself to Mr. Goodenough yesterday at the annual luncheon of the British Export Society, who recently elected him their President as "an onlooker" who is closely watching "the game" of salesmanship overseas. We publish elsewhere considerable extracts from his speech on that occasion, because it contains much which is of the essence of the matter of successful commerce at home as well as abroad. "The success of all business depends ultimately upon the friendship and confidence of the customer. . . . To-day, in the realm of Commerce, the Customer is King." It would be a grand thing for the future of gas if these words could dominate the mind and policy, not only of every gas official and workman, but of every gas director in this country, for it is indeed true that "salesmanship, if it is to eventuate in permanent profitable trade, must begin in the board room; must control the factory and transport organization; and must continue in service after sale. . . . The efforts and enthusiasm of the best salesmen are easily nullified by indifference or incompetence at headquarters."

We do indeed need to remind ourselves, in words which we have slightly adapted from Mr. Goodenough's

speech, that "we are no longer in the golden days of Queen Victoria, when the output of British" *gas-works* "practically sold themselves. Queen Victoria is dead! We are living, and have to make our living, in the days of King George V.; we live in the strenuous, desperately competitive days of the Monarch who 27 years ago begged commerce and industry to 'wake up'"—a call now repeated to British trade by the Prince. [The greater part of His Royal Highness' speech is reproduced on a later page of this issue.] Let us of the gas industry, proud as we are to be recognized as pioneers in efficient salesmanship, be sure that we are all—everywhere and all the time—wide awake, and that we are continually improving our selling and our service methods to meet continually intensifying competition. The price of progress is eternal vigilance.

Eliminating Inferior Appliances.

"IT has to be borne in mind that lighting burners in bad condition tend to discredit gas in the heating as well as in the lighting field." This sentence occurs in the paper on "Inspection and Maintenance of Gas Appliances" which was contributed by Mr. Stephen Lacey, the Distributing Engineer to the Gas Light and Coke Company, to the proceedings of the Joint Gas Conference at the British Industries Fair, Birmingham, on Wednesday last, and which is published *in extenso* in the "GAS SALESMAN" Supplement of this issue of the "JOURNAL." Lighting does not constitute a large proportion of the Gas Light and Coke Company's total sales. As a matter of fact, ordinary domestic lighting accounts for only 2 p.ct. In other undertakings situated differently from this, however, the incidence of lighting is far greater, and in some concerns situated in rural surroundings it remains of extreme importance. Hence, whatever system of maintenance be adopted, the lighting load should invariably receive careful attention. The trouble is, of course, that the majority of consumers are by no means anxious to avail themselves of burner maintenance at a fixed tariff, though the latter may involve them in practically no expense—in the case of the Gas Light and Coke Company the charge is 2d. per burner cleaned. Yet this charge, in view of the relatively small proportion of the lighting load, involves the Company in financial loss.

The thought naturally arises: Is an undertaking justified in carrying-out work such as this which is unsound (*per se*) financially? The answer is given by the opening sentence of this article. Progressive gas undertakings have no choice but to accept it as an essential business proposition. At the same time much good can be done by educating consumers regarding the virtues of well-designed burners and the vices of inferior ones. To our readers, this statement will appear a mere platitude. So it is; but the fact remains that the sale of shoddy burners still continues, and it has, in the words of Mr. Lacey, "done more than anything else to discredit gas lighting." Bearing this in mind, one can only feel grateful that the Cardiff Gas Light and Coke Company—to quote an example—have prepared an artistic list of gas lighting fittings which includes advice on the cleaning and maintenance of the burners by the consumers themselves. The Gas Light and Coke Company—and this, we trust, is typical of the sales methods of other undertakings throughout the country—are doing all possible to render it easy for their prepayment consumers to obtain good burners, and are distributing leaflets describing the way to adjust these burners and to keep them in good order.

The time is long since past when it was necessary to stress the value of general maintenance schemes. All gas undertakings are now agreed that some system should be regarded as part and parcel of their work, though there is the danger that the difficulties of putting theory into practice may at times lead to the word being taken for the deed. We are now concerned with the practice of maintenance, no longer with the idea; and Mr. Lacey's paper demonstrates clearly that success has rewarded their persistent efforts in bringing into practice a scheme the cost of which is borne not by the price of gas—in which method, of course, some consumers are contributing towards the maintenance of other people's appliances—but by the rentals charged for hired appliances and by maintenance contracts in respect of privately-owned apparatus. Not every undertaking would find it possible to adopt *in toto*, though on a smaller scale, the system of the Gas Light and Coke Company; but each concern, to achieve success, must follow the principle of the latter Company, which is to lay the foundations of an inspection and maintenance scheme on a sound basis, and to build slowly but surely. The principles underlying the Company's system are clearly defined by Mr. Lacey, and his account of its progress merits the closest attention and must give rise to steady optimism.

Reference has already been made to shoddy lighting burners. The question, however, by no means ends there. Inferior gas appliances of all types are still being sold and installed by those whose only concern is to make quick profits. "This difficult question," observes Mr. Lacey, "has been before the industry for years, and I do not think anyone can honestly say that even now we are in sight of a solution of the problem. Nothing short of unremitting work on the part of all who have the permanent interest of the gas industry at heart will serve; and what is more, our efforts must be intelligently co-ordinated if they are to succeed." We agree, and suggest that the best method of attacking the problem is for the industry to institute some central organization for the testing, approval, and stamping of all gas apparatus. Thanks to the work at Watson House and at similar testing stations, a mass of data is being collected which will facilitate the inauguration of some such organization as is here suggested.

Royalty at the British Industries Fair.

His Royal Highness the Duke of York visited the British Industries Fair at Castle Bromwich last Thursday afternoon, and honoured the Gas Industries Section by calling at the Central Bureau and signing the visitors' book.

Low-Temperature Carbonization.

Last Monday the "Financial Times" commenced a series of articles indicative of the present position of low-temperature carbonization. An attempt is being made to outline the situation in regard to every process in Great Britain. Forty-three processes are at the moment under active consideration in this country, and the total capital represented by them, states the "Financial Times," probably exceeds £7,000,000.

Smokeless Fuel Production at Richmond.

A letter by Mr. James H. Macauley, commenting on the successful completion of the Gas Light and Coke Company's plant at Richmond for the manufacture of low-temperature smokeless fuel, was published in the same issue of the "Financial Times." This step, suggests the writer, is of incalculable benefit to the gas industry, for "it will bring about a revolutionary change in the methods heretofore adopted. . . . It is a matter of congratulation for shareholders in the Gas Light and Coke Company to feel that they have been pioneers in solving the problems connected with this most intricate subject."

Low-Temperature Motor Fuel.

Satisfactory ground tests on the suitability of low-temperature motor spirit for aeroplane engines were carried out at the Stag Lane Aerodrome, Edgware, last Friday, in the presence of Members of Parliament, Government departmental officials, and representatives of the motoring, fuel, and aviation industries. It was intended that an exhibition of straight and acrobatic flying should be given, but owing to a dense fog flights were impossible. According to Lieut.-Col. W. A. Bristow the "Gyro" cracking process is peculiarly suited to the extraction of motor spirit from fuel oils obtained by low-temperature carbonization. The rights to use this process in Great Britain have been acquired by Petroleum Refineries, Ltd.; and it is intended to erect plant in Yorkshire as the first instalment of what Col. Bristow terms the new "coal-oil industry." It is suggested that the cracking plant will provide a clearing house for low-temperature oils from the various plants throughout the country.

PERSONAL.

Following upon the recommendation of the Joint Research Committee of the Institution of Gas Engineers and the University of Leeds, now accepted by the Councils of the Institution and the University, Mr. F. J. DENT, B.Sc., has been appointed Gas Research Chemist in succession to Dr. A. Parker, who has resigned in order to take up a responsible post with the Water Pollution Section of the Department of Scientific and Industrial Research. Mr. Dent went to the University of Leeds from the Leeds Boys' Modern School with a Leeds City Scholarship, and after a four years' course graduated B.Sc., with 1st Class Honours in Gas Engineering, being awarded the Le Blanc Medal for special distinction in applied science. For the last two years, Mr. Dent has held the Institution Gas Research Fellowship; and the Fellowship Reports for 1927 and 1928 contain the results of his research work, carried out under the direction of Prof. J. W. Cobb, upon the gasification of special cokes in oxygen, and upon heat-treatment in hydrocarbon and other gases as a factor influencing the reactivity of coke.

Fifty years in the employment of the Wellingborough Gaslight Company—first as Assistant Engineer and Manager, and later as Engineer and Manager—is the record of Mr. JOHN THOMAS LEWIS; and the jubilee of his service was recently recognized by presentations from the Company and the employees. He received his portrait from the Chairman of the Company, Mr. J. T. Parker, and the works staff gave him a handsome clock. Mr. Lewis is the son of the late Mr. J. Lewis, who was Manager of the Higham Ferrers Gaslight Company before it was merged in the Rushden Company. He was born at Higham Ferrers in 1856, and began work with his father, from whom he gained his earliest knowledge of gas production. He left the district for three years, working during that time in the North of England, and was then offered the post as Assistant to Mr. George Powell, who was at that time the Manager of the Wellingborough Gaslight Company. Mr. Lewis took up his duties at Wellingborough in 1878. Four years later, on Mr. Powell's retirement, he was appointed Engineer and Manager, and has held the post ever since. In his capacity of Consulting Engineer he has superintended reconstruction or erections of gas-works at Irthlingborough, Finedon, Thrapston, Burton Latimer, and Raunds. Mr. Lewis is Chairman of the Irthlingborough Gaslight Company. He was President of the Midland Association of Gas Engineers and Managers in 1898, and he has held many public offices.

Mr. R. W. HAMMOND has been appointed Sales Representative to Messrs. Joymanco (Brighton), Ltd., of Hove. He is the younger son of Mr. W. H. Hammond, Resident Engineer and Manager of the Eastbourne Gas Company, and was articled to Mr. T. N. Ritson, of the City of Chichester Gas Company. He filled a position on the distribution staff of the Eastbourne Gas Company; afterwards being selected to take charge of the showroom of the Ashford Urban District Council Gas Department.

OBITUARY.

The death is announced of Mr. E. W. GREEN, for some time Secretary to the Branyard Gas Company.

We regret to have to record the death, which took place at the Royal Victoria Infirmary, Newcastle-on-Tyne, on Feb. 16, of Mr. SAMUEL MONTAGUE SHADBOLT, A.M.I.Chem.E. Many of our readers will remember him as the Engineer of the Chemical Engineering and Wilton's Patent Furnace Company, Ltd., of 76, Victoria Street, S.W.1. After twenty-six years service with this Company, he had just taken up a new appointment with the Mid-Durham Carbonisation Company, Ltd., as Manager of their Stella Gill Coke Oven and Bye-Product Works; and on the evening of Jan. 29, on paying a visit to the works, he stepped into a sump of boiling water, and was removed to the Royal Victoria Infirmary, suffering from shock and severe scalds. Mr. Shadbolt was the eldest son of Mr. Frederick Shadbolt, also of the Chemical Engineering Company. The interment took place in London at the Hendon Cemetery on Feb 22, and a large number of his colleagues attended.

INSTITUTION OF GAS ENGINEERS.

Council Meeting.

A Meeting of the Council was held at 28, Grosvenor Gardens, Westminster, on Feb. 13; the PRESIDENT (Mr. John Terrace) occupying the Chair. There were also present Messrs. C. S. Shapley (Leeds) and H. E. Copp (Hull), Vice-Presidents; Mr. W. E. Price (Hon. Secretary), and Messrs. C. Valon Bennett (Rochester), C. F. Botley (Hastings), H. E. Bloor (York), J. Herbert Canning (Newport, Mon.), Thomas Carmichael (Portsmouth), D. Walter Davies (Tredegar), R. H. Ginman (Leek), H. D. Madden (Cardiff), P. G. G. Moon (Bournemouth), R. Robertson (Bristol), H. C. Smith (Tottenham), F. P. Tarratt (Newcastle-on-Tyne), and James W. Campbell (Secretary).

Letters of regret at absence were received from Messrs. W. Eames Caton (Oxford), W. G. S. Cranmer (Shortheath), Dugald Currie (South Shields), L. W. Dalby (Wicklow), R. E. Gibson (Liverpool), J. B. Hansford (Bedford), J. W. Napier (Alloa), W. W. Townsend (Colchester), J. Wesley Whimster (Bath), and John Wilkinson (Nottingham).

The minutes of the last meeting were confirmed and signed.

The Council rose in silent respect, on the intimation of the deaths of Provost Alan Reid, of Brechin, Mr. Thomas Frizelle, of Holywood, Co. Down, and Mr. Leonard Askew, of Westminster, all members of the Institution.

The following were approved as candidates:

Members.

Mr. Alan Ashley, Engineer and Manager, Gas and Water Department, Ellesmere, Salop.

Mr. Thomas Cranby, Engineer and Manager, Gas and Water Department, Kendal.

Associate Members.

Mr. William Ramforth Branson, Pupil Engineer of the Gas Light and Coke Company.

Mr. Joseph Brook, Assistant Engineer, Corporation Gas-Works, Batley.

Mr. Charles Eric Sanderson, Technical Assistant, Royal Gas Factory, Woolwich Arsenal.

Mr. Harold Sayers, Assistant Engineer, Aberystwyth Gas Company.

Mr. John Thomas Spenser, Technical Assistant, Weston-super-Mare Gas Light Company.

The following were transferred to the class of Member: Messrs. William James Baker, Assistant Engineer in Chief, Shanghai Gas Company; and Tom Valentine Johns, Manager, Lowestoft Water and Gas Company.

Mr. G. Alec Mogford, a former pupil of, and now Assistant to, Mr. H. D. Madden, at Cardiff, was admitted as Student.

THE ROYAL CHARTER.

The PRESIDENT, Mr. John Terrace, then referred to the progress made with the application to the Privy Council for a Royal Charter for the Institution.

Reference was then made by the President to the satisfactory arrangements, which had been agreed to, for the consideration of all matters relating to research work, and the machinery necessary to bring the information of its progress and suggestions of new work to the notice of the Council at regular intervals. The General Research Committee, he said, would act as the connecting link between the Institution Council and the various bodies undertaking investigation work.

An offer of the endowment of a further Scholarship through the Institution, to be held by a student who intends to train as a gas engineer, in the University of Leeds, was received; and its acceptance was agreed to, with expressions of gratitude to the proposed donors.

A provisional outline programme of the Annual General Meeting, to be held on June 4, 5, and 6, at the Institution of Civil Engineers, London, was submitted; and afterwards the President referred to the arrangements being made for a visit to Berlin in the following week for the meeting of the German Association of Gas and Water Engineers and the German Gas and Water Exhibition.

Consideration was then given to the representation of the Institution at the World Power Conference at Tokyo, and the provision of papers at the Conference representative of British gas progress.

The annual accounts for the year 1928, showing continued progress, were then submitted and approved. The President, Mr. John Terrace, and the Hon. Secretary, Mr. W. E. Price, were elected to represent the Institution on the Joint Finance Committee of the National Gas Council, the British Commercial Gas Association, and the Institution.

Reports were received from the Ammonia Sub-Committee, showing the nature of the inquiries that are being conducted; and from the Effluents Sub-Committee, giving information on the progress of the work and the manner in which the resources of the Sub-Committee are being put to the service of gas undertakings throughout the country.

It was agreed that the Institution should be represented officially, by Mr. Ralph Halkett, at the Congress of the Royal Sanitary Institute to be held at Sheffield in July.

FORTHCOMING ENGAGEMENTS.

[Secretaries of Gas and Kindred Organizations are asked to assist in making this diary of events as complete and useful as possible by sending the earliest intimation of all meetings.]

Feb. 28.—BRITISH COMMERCIAL GAS ASSOCIATION.—Annual meeting of the Midland District in the Grand Hotel, Birmingham at 3.15 p.m.

March 1.—MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.—Annual meeting.

March 2.—WESTERN JUNIOR GAS ASSOCIATION.—Visit to the Stroud Gas-Works. Paper by Mr. C. Bateman, of Bath.

March 5.—BRITISH COMMERCIAL GAS ASSOCIATION.—Annual meeting of the Manchester District in the Lord Mayor's Parlour, Town Hall, Manchester, at 2.30 p.m.

March 6.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Visit to the London Works of Messrs. James Keith and Blackman Company, Ltd.

March 7.—MIDLAND ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Annual general meeting at the Grand Hotel, Birmingham, 2.30 p.m.

March 7.—BRITISH COMMERCIAL GAS ASSOCIATION.—Annual meeting of the Wales District in the Gas Offices, Bute Terrace, Cardiff, at 4 p.m.

March 9.—SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).—Meeting in the Royal Technical College, Glasgow. Paper by Mr. A. Bujnowski on "Ventilation and Gas Fires."

March 12.—FEDERATION OF GAS EMPLOYERS.—Meeting of Central Committee.

March 12.—NATIONAL GAS COUNCIL.—Meeting of the Central Executive Board.

March 14.—MIDLAND JUNIOR GAS ASSOCIATION.—Meeting at Birmingham. Paper by Mr. F. A. Jenkins on "A Short Account of an Education Scheme for Boys and Fitters' Youths;" and a paper by Mr. F. A. C. Pykett on "Reducing Maintenance Costs of Mains and Services."

March 15.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Meeting at the Hotel Cecil at 2.15 p.m.

March 16.—SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT).—Meeting and visit to Messrs. Peebles' Tay Works, Bonnington.

March 16.—WALES AND MONMOUTHSHIRE JUNIOR GAS ASSOCIATION.—Meeting at Neath. Paper by Mr. J. W. Thomas.

March 20.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—Meeting.

March 20.—MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.—Joint visit with Yorkshire Junior Gas Association to the new Sharlston Collieries Co., Ltd., Crofton; and to Messrs. Geo. Craddock and Co., Ltd., Wire Rope Works, Wakefield.

March 20.—YORKSHIRE JUNIOR GAS ASSOCIATION.—See Manchester and District Junior Gas Association above.

March 21.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—Meeting.

March 22.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Meeting at the Westminster Technical Institute, S.W. 1. Paper by Mr. S. G. Watson.

March 23.—SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).—Visit to Dawsholm Gas-Works, Glasgow.

H.R.H. THE PRINCE OF WALES ON BRITISH SALESMANSHIP.

His Mansion House Speech Broadcasted.

Gentlemen, this is the third occasion on which I have had the privilege of speaking in connection with this great industrial fair. I did not find it very easy the other times when I had to address so many experts; and though no less diffident to-night, I am particularly glad to do what I can again towards helping on this great enterprise, as I feel it must be the wish of each one of us, and especially this year, to help it along with the conviction that by so doing we are decreasing the enforced idleness of so many of our fellow-countrymen.

[Here His Royal Highness made a feeling reference to unemployment, and to his belief in the part which overseas settlement might play in its alleviation.]

But I am wandering—perhaps I am dreaming—and I must get back to earth, which happens to-night to be the British Industries Fair, which has flourished and increased in size both in London and in Birmingham for more than 10 years. Its progress has been remarkable in both those great cities, and all concerned in London with the success of the London Fair, and the Birmingham Chamber of Commerce and successive Lord Mayors and Aldermen of that great city who are concerned with the Birmingham Branch, are to be most heartily congratulated. I understand that the two branches of the Fair, though widely different in their interests, constitute a kind of mutual admiration society. [Laughter.] That is as it should be.

Now, some people might ask what is the use of such great industrial fairs, and how can they really help towards restoring the normal flow of our export trade. Well, they do; and the best answer is that the manufacturers who are the exhibitors at these fairs go on booking space for stands, which they most certainly would not do if it were not worth their while. They find, first of all, that the Fair is an opportunity of selling their goods, and they also find it an opportunity of showing that, given the necessary modern equipment and methods, the British workman can hold his own with anybody in the world.

Proof of this, I think, can be found in the rapid growth of some of our post-war industries, such as artificial silk and the electrical and wireless trades. So that side of the question seems to be all right—that the men, given the equipment, can make goods as well as anybody else. And then the obvious remark to follow would be that, if we find the markets and create a demand we will be able to bring many of our somewhat obsolete manufacturing plants up to date with modern requirements.

UP-TO-DATE SALESMANSHIP.

But, gentlemen, you will not find the markets or create that demand unless you have up-to-date salesmanship. The question I want to ask you and your other industrial colleagues and experts is this: Is the salesmanship of this country entirely up to date? Is the salesmanship of this country up to the standard of the workmanship of the men? I am asking this question to-night because I am very interested. I have never tried to sell anybody anything in my life, except a few horses. [Laughter.]

Another reason why I am very interested is because I travel a good deal, and I sometimes come up against the somewhat sad state of affairs of a British community many thousands of miles away from home who are anxious to buy British goods but are unable to because the goods are not suitable or practicable to the locality. There must be something utterly wrong for such a state of affairs to exist, and I can only surmise that local conditions and requirements have not been sufficiently studied. Either a quantity of the wrong type of a certain article has been sent out, which is quickly scrapped by your agent in favour of the goods which our foreign competitors have sent out to suit local requirements, or there have been no orders at all. The same applies in foreign countries.

Some of you to-night may be wondering what right I have to lay down the law on such a subject in which I am not an expert. It may or may not be that I have that right, but I do feel it my duty to tell our manufacturers at home if I have found anything wrong at the marketing end. [Cheers.]

BRITISH GOODS WANTED.

Even on such an occasion of celebration as this, when we are congratulating ourselves on the British Industries Fair, no good can come of patting ourselves on the back. We can celebrate our successes only when we have seen and rectified our own faults. Some fault there undoubtedly is in our salesmanship, because I know from personal experience—and a good deal of it—that there is a desire, and a very strong desire, not only in the British Possessions overseas, but i foreign countries as well, to buy goods manufactured in Great Britain in preference to others if—but only if—those goods suit their requirements. [Cheers.]

I am glad to hear that salesmanship is now being studied by a representative Committee, and it would be out of place for me to anticipate its report, which I am sure will include, among the requisites that it advises, personality, knowledge of the goods, knowledge of the condition and the language of the country where the goods are to be sold—["Hear, hear"]—and then tact and good manners. Each of these I feel—and so must many of you—is of very great importance.

Now I think we might put personality first. When a lot of men come to sell you something, you will be much more likely to buy it from the fellow you look on as a friend. Apart from learning the local conditions, try to learn the language, because you will sell the thing better in that way. Then if the head of the firm—or, to use a slang word, "the boss"—

if "the boss" can go out and do business for himself or the firm, he will do it very much better than by leaving it to other people. [Cheers.]

One final word. In future developments we have little to fear. The miracles of to-day are the commonplaces of to-morrow, and who can say what the next few years will hold out to us? Our requirements and methods of production will, I hope, be evolutionized; and in such an evolution we can be confident of holding a firm place in the world's progress. Progress brings prosperity and greater happiness to our people; and progress is greatly assisted, as is the problem of which I have already spoken to-night—the finding of employment for so many thousands—by the exhibition of goods both in London and in Birmingham, and that is why I wish every possible success to the 1929 British Industries Fair. [Loud cheers.]

GAS STOCK AND SHARE MARKET.

[For Stock and Share List, see later pages.]

THE Stock Markets, influenced doubtless by the more favourable monetary position, showed signs of improvement last week. British Government securities were firmer, and the recent reduction in prices created a better demand for Foreign Government Bonds. There was also more activity in Industrials, but the American stimulus was lacking.

In the Gas Market, stocks and shares in undertakings operating abroad continued to be the centre of attraction. The Primitiva ordinary shares were the most sought after, and at one time touched 38s. 6d.; the quotation being raised by 8s. 6d. to 36s.-38s. This improvement was generally attributed to American purchasing; but one financial expert puts forward the opinion that "the recent buying has been due to an effort at consolidation of interests in *overseas gas concerns*." This is a rather sweeping statement; and in the absence of any definite announcement by any of the undertakings, one is inclined to advise caution in the matter of investment at the present high prices. This applies, in addition to the Primitiva shares, to Imperial Continental stock, 20 points higher at 410-430; and European shares 3 points higher at 18-20. It is clear that the present high values are a great temptation to existing holders; and there is little doubt that a large number will dispose of their interest while the going is good. With regard to the Continental Union stock, the Company's announcement this week of their intention to distribute by way of bonus £100,000 new stock among holders of ordinary stock in the proportion of £1 for each £8 of ordinary stock held, justifies the improved market value.

With regard to the English undertakings it will be seen that a large number of quotations have been marked down *ex* div., apart from which the only change of importance is the rise of 2 points to 95-100 in Uxbridge 5 p.ct. Among the dividend announcements for the half-year to December were Bournemouth, 9 p.ct. p.a. (against 8½ p.ct.); Chester, 6½ p.ct. p.a. (the same); East Hull, 5 p.ct. p.a. (the same) Hornsey 3½ p.ct., 6 p.ct. p.a. (against 5 p.ct.); Liverpool, 6½ p.ct. p.a. (against 5½ p.ct.); and Southampton, 5 p.ct. (the same).

The following transactions were recorded during the week:

MONDAY.—Alliance and Dublin, 100, 101½; Bournemouth 5 p.ct., 13¼; Brighton 6 p.ct., 116½; Cardiff, 98½; Colombo, 37s. 9d., 38s.; Commercial, 101¾; Continental Union, 123½, 125; Croydon sliding-scale, 113, 113½; European, 15½, 16, 16⅛, 16¼, 16½; Gas Light and Coke, 19s. 4½d., 19s. 6d., 19s. 7½d.; 3½ p.ct., 66⅛; 4 p.ct. pref., 79¾; 5 p.ct. deb., 101½; Imperial Continental, 405, 407, 408, 410, 410½, 411, 412, 413, 415, 416, 418, 419, 420, 422; Primitiva, 28s., 28s. 3d., 28s. 6d., 28s. 7½d., 28s. 9d., 28s. 10½d., 29s.; South Metropolitan, 108½, 110; 6½ p.ct. deb., 102½; Southampton 5 p.ct., 78; 4 p.ct. deb., 73; Wandsworth new ordinary, 104½. Supplementary prices: Brighton and Hove 4 p.ct. deb., 75; Liverpool 5 p.ct., 91.

TUESDAY.—Alliance and Dublin, 100½, 101; Bombay, 21s. 6d.; Bournemouth 5 p.ct., 13⅜; British, 119; Colonial, 26s.; 8 p.ct. pref., 22s.; Commercial, 101¾; Continental Union, 123, 125, 126, 127, 127½, 128; 7 p.ct. pref., 123½; European, 16, 16¼; Gas Light and Coke, 19s. 4½d., 19s. 6d., 19s. 7½d., 19s. 9d.; 4 p.ct. pref., 78, 79⅛, 79¾; 3 p.ct. deb., 59½, 60⅛; 5 p.ct. deb., 101¼; Imperial Continental, 410, 411, 412, 413, 415, 416, 417, 418, 419, 420; Montevideo, 99½; Primitiva, 28s. 9d., 29s., 29s. 1½d., 29s. 3d., 29s. 6d., 29s. 7½d., 29s. 9d., 30s., 30s. 2½d., 30s. 3d., 30s. 6d., 30s. 9d., 31s., 31s. 6d., 32s., 32s. 6d., 32s. 7½d.; South Metropolitan, 109, 109½; 3 p.ct. deb., 60; Southampton 4 p.ct deb., 74. Supplementary prices; Aldershot "A," 85½; Brighton and Hove 4 p.ct. deb., 75s. 6d.

WEDNESDAY.—Alliance and Dublin, 100⅜, 101, 101½, 102; Commercial, 102; Continental Union, 128½, 129¼, 129½, 130, 131; European, 16⅜, 16½, 16⅝, 16¾, 16⅞; Gas Light and Coke, 19s. 3d., 19s. 4½d., 19s. 6d., 19s. 7½d.; 5 p.ct. deb., 101¼; Imperial Continental, 415, 417, 418, 419, 420, 421, 422, 422½, 422¾, 423, 424, 425; Primitiva, 32s., 32s. 1½d., 32s. 3d., 32s. 4½d., 32s. 6d., 32s. 7½d., 32s. 9d., 32s. 10½d., 33s., 33s. 3d.; South Metropolitan, 109; 6 p.ct. pref., 111½; 3 p.ct. deb., 59⅜; Tottenham 3½ p.ct., 102½, 103. Supplementary prices: Oxford consol., 135½, 136.

THURSDAY.—Alliance and Dublin, 101½; Brighton and Hove 5 p.ct., 103; British, 119½, 120; Commercial, 99 *ex* div.; Continental Union, 129, 129¼, 130, 130¼; European, 16⅜ 16⅞, 17, 17⅛, 17⅜, 17½, 18, 18⅜, 18½, 18¾, 18⅞, 19, 19⅛, 19½; Gas Light and Coke, 19s. 1½d., 19s. 2½d., 19s. 3d., 19s. 4½d., 19s. 7½d., 19s. 9d., *ex* div.; 4 p.ct. pref., 78 *ex* div.; 3 p.ct. deb., 60¼; 5 p.ct. deb., 101¼; Imperial Continental, 417½, 418½, 420, 421, 422, 423, 424, 425, 426, 427, 428; 3½ p.ct. deb., 70; Malta and Mediterranean, 5⅞, 6⅛; Newcastle 3½ p.ct., 17s. 10½d. *ex* div.; 4 p.ct. pref., 71½ *ex* div.; Oriental, 118; Primitiva, 32s., 32s. 9d., 33s., 33s. 2¼d., 33s. 3d., 33s. 6d., 33s. 9d., 34s., 34s. 9d., 35s., 35s. 2½d., 35s. 3d., 35s. 6d., 35s. 9d., 36s., 36s. 2½d., 36s. 6d., 37s., 37s. 3d., 37s. 4½d., 37s. 6d., 37s. 9d., 38s., 38s. 6d.; South Metropolitan, 106½, 107½ *ex* div.; 6 p.ct. pref., 109 *ex* div. Supplementary prices: North Middlesex, 6 p.ct. pref., 110½.

FRIDAY.—Alliance and Dublin, 100½; Cardiff 7½ p.ct. deb., 102½; Commercial, 100; 3 p.ct. deb., 58; Continental Union, 125, 127, 127¾, 128, 128½, 129, 129½, 129¾, 130; European, 18¾, 19, 19¼, 19½, 19⅝, 19¾, 20, 20½; Gas Light and Coke, 19s. 1½d., 19s. 3d., 19s. 4½d., 19s. 6d.; 4 p.ct. pref., 78; 3 p.ct. deb., 59⅝; 5 p.ct. deb., 101¼; Imperial Continental, 420, 422, 422½, 423, 424, 425, 425½, 426, 427; 3½ p.ct. deb., 71; Newcastle 3½ p.ct., 17s. 3d.; 4 p.ct. pref., 72½; Primitiva, 34s. 3d., 36s., 36s. 1½d., 36s. 3d., 36s. 6d., 36s. 7½d., 36s. 9d., 37s., 37s. 1½d., 37s. 3d., 37s. 4½d., 37s. 6d., 37s. 9d., 37s. 10½d., 38s., 38s. 3d., 38s. 6d.; 4 p.ct deb. (1911), 79½; South Metropolitan, 107; Uxbridge 5 p.ct., 96½; Wandsworth "B," 126; 4 p.ct. deb., 78. Supplementary prices: Farnham 6 p.ct. pref., £10 16s. 9d.; Gravesend and Milton 5 p.ct., 70; Liverpool 5 p.ct., 90½.

Money was plentiful in Lombard Street at the close of the week; and balances were offered for the night at under 3½ p.ct., the usual rate for both old and new loans being 4 p.ct. There was a strong demand for Treasury Bills; and £30,000,000 were allotted at an average of £5 3s. 8·78d. p.ct., being 1s. 6·65d. p.ct. below the average for the previous week. The lower rate had, however, no effect on the Discount Market; and rates were firm—5¼ p.ct. being charged for 3 months' fine bank bills.

The Bank Rate is 5½ p.ct., to which it was raised from 4½ p.ct. on Feb. 7. The Banks' deposit rate is 3½ p.ct., and the deposit rates of the Discount Houses are 3½ p.ct. at call and 3⅝ p.ct. at notice.

"Low-Temperature Carbonization Explained."—This is the title of a new book written by Dr. Murray Stuart (at one time Chemist in the Birmingham Corporation Gas-Works) and published, at 4s. net, by Mining Publications, Ltd., Salisbury House, E.C.2. In this the author states that the low-temperature distillation industry as a whole cannot look for any sale for any gas manufactured; and any prospectus showing a probable balance-sheet allowing credit for the sale of gas should be viewed with suspicion, unless the contract with the purchasing gas company is published. The idea of the book is to place before investors a few fundamental facts concerning low-temperature carbonization.

"Carbonization Technology and Engineering."—Messrs. Charles Griffin & Co., Ltd., of Drury Lane, London, have just published a volume (at 36s. net) by John Armstrong entitled "Carbonization Technology and Engineering." The work is profusely illustrated by photographs, plans, and diagrams, and contains complete general and name indexes. Among many subjects dealt with are comprehensive articles on coal carbonization by various processes, and chapters on the constitution of coal, refractory materials, the theory of coking, together with methods of quenching and the disposal of breeze. A review of this book will appear shortly in our columns.

ANNUAL LUNCHEON OF THE BRITISH EXPORT SOCIETY.

Address by Mr. F. W. Goodenough (the President) on Salesmanship Overseas—Weaknesses in British Methods - Out-of-Date Attitude Towards the Customer—The Need for Action by Industry.

The third Annual Luncheon of the British Export Society was held yesterday at the Savoy Hotel, and was attended by many influential men in commerce, industry, and the public service, including Lord Eustace Percy (President of the Board of Education), Lord Riddell, Sir George Beharrell, and Sir Edward Crowe (Comptroller-General of the Department of Overseas Trade).

Proposing the toast of "Our Visitors," coupled with the name of Lord Eustace Percy, Mr. Goodenough referred to the still gloomy outlook in the export trade, and said:

Self-Help, Not State Help.

There are, happily, gleams of light in the sky. The great and ever-increasing success of the British Industries Fair is a matter for much satisfaction, and a splendid demonstration of the determination of British traders to overcome the difficulties of the present as they have overcome those of the past. De-rating promises a measure of relief to industry which will enable us to sell more cheaply; and for anything that will do this we are grateful. Politicians are ever striving to discover the political pill that will bring about the much-needed revival of trade. But what industry needs most of all is not State help but self-help. We want to get out of the way of thinking—those of us who do—that all the ills of the body economic can be cured by political means; that somebody else is to blame for our difficulties, and that it is somebody else's job to get us out of them. It is first and foremost our own job; and the sooner we all get on with it, as some have already done, the better. That is, surely, the first point for us to take from the courageous, statesmanlike, and striking speech of H.R.H. the Prince of Wales at the Mansion House a week ago—a speech that has set the echoes ringing round the world of Commerce and Industry, as did that of his Father at the Guildhall a generation ago; a speech most welcome to those at present studying, at the bidding of the Government, the problems of salesmanship; a speech which, as I shall show you presently, is supported by unmistakable evidence from expe students of the situation overseas.

As I have said, it is up to business men to overcome business difficulties. Governments may help, and can help; they also may hinder; and it is imperative that we should realize and act upon the realization that it is for Commerce and Industry to work out their own salvation—as British manufacturers and merchants always have been able to do when they have realized the problems with which they have to deal. The most hopeful factor in the situation is, I think you will agree, that we have had a year of industrial peace; and, despite the temporary check to our hopes of permanent improvement in the organization of relations between the two great partners in industry, we all refuse to believe that the work of the Melchett-Turner Conference will fail to produce, by one means or another, a lasting benefit to the nation. Peace at home and abroad is essential to the prosperity of all grades of workers, and the prospects of peace are brighter to-day than for many a year.

But if we are to reap the benefits of freedom from industrial unrest and world disturbance, we have got to set our house in order right quickly; and while no one would be foolish enough to think we have done all that is possible, though we have done much, to improve our productive efficiency, and while we welcome every sign of the rationalization of production, there is no doubt that the direction in which action is most urgently demanded is in that of improving our methods of marketing our goods abroad, in which term must be included not only methods of obtaining orders, but those of executing them. Salesmanship—the very core of commerce—if it is to eventuate in permanent profitable trade, must begin in the boardroom, must control the factory and transport organization, and must continue in service after sale. The selling policy of a firm determines its success or its failure.

Having referred to the instruction to his Committee to make recommendations for the improvement of methods of marketing British goods overseas (as well as at home) and to the reports now being received from our representatives all over the world, Mr. Goodenough proceeded:

Efficient Salesmanship Defined.

The most useful way, it seemed to us, of analyzing and summarizing the views expressed by the Empire's trained observers on the spot was first of all to set out the fundamental principles of efficient salesmanship, which are universal in their application to all classes of trade in all parts of the world, and then see in what directions and to what degree practice appears to depart from principle and so to require amendment. The Committee defined the object of efficient salesmanship as being to persuade the largest possible number of potential buyers to purchase, and continue to purchase, on terms reasonably remunerative to the seller, the maximum quantity of goods or services the buyer can utilize with advantage to himself; and thereby to establish permanent business relations of mutual profit, based upon goodwill and confidence between the transacting parties. The root principle of this statement is that the success of all business depends ultimately upon the friendship and confidence of the customer. Accepting the truth that people deal most willingly with those they feel most friendly towards and put most confidence in, we get to further vital considerations. People feel most friendly towards, and put most confidence in, those who take trouble to get thoroughly to know them and their needs and wishes, their customs and habits, and then proceed to supply their needs and gratify their wishes most completely, satisfactorily, and punctually at a reasonable cost; and who, further, are ready at all times promptly to remedy faults of service or to modify designs of goods or methods of service to meet the customer's changing needs or tastes. For this, it is obviously essential first of all to visit the country and study its geography, its climate, its customs, its means of transport, its literature, its newspapers, and the mentality of its inhabitants. It is clearly necessary to be able to converse with them and write to them in their own language, to read their books, their newspapers and their trade reports, and to conduct all transactions in their own currency and by their own system of weights and measures.

As a decidedly inferior alternative to the ideal of such personal knowledge of country, people, and language by principals and salesmen alike, satisfactory relations between buyer and seller may be established and maintained through carefully chosen local agents. But, however carefully the agent be chosen, this alternative is only capable of securing satisfactory results provided, further, that the local agents are properly backed by adequate advertising and propaganda; are kept well-informed in every detail by the manufacturer; are supported by good service in every particular; are consulted and their advice respected as to the suitability of goods and service; and finally, but by no means of least importance, provided they are frequently visited in their own country by principals, as well as occasionally invited to the producing country for conference and instruction.

Modern Languages.

Now with those principles and these requirements based upon them before us, what do we find from the reports furnished us from expert observers in the overseas markets? First and foremost, from almost every foreign country we get the same lament—namely, that in all too many cases our representatives do not speak or write the language of the potential buyer; that there are still not a few export firms who correspond with him in English, quote him in English currency, send him catalogues in the English language with prices and quantities in English terms; and then apparently expect to compete with nations who carry through all their transactions in the buyer's language and commercial terms—firms who are, indeed, actually surprised and puzzled when business passes from them to their competitors. The Committee are accordingly asking the President of the Board of Education to arrange for an investigation into the teaching of modern languages in this country, and a comparison, first, of our educational facilities in that direction with those provided in other countries, and secondly of the use made of those facilities here with the use made of theirs by our competitors.

Insularity and Self-Sufficiency.

The picture, however, presented to us by reports from overseas and by other evidence which reaches us from those experienced in foreign trade, is not one merely of ignorance of foreign languages. The picture of which the latter, while a very important part, is only a part, is one of something amiss in the outlook on the world and their attitude towards it of many export firms to-day. While British traders have already accomplished marvels in overcoming the enormous post-war difficulties which this hard-hit country has had to encounter while staunching her economic wounds, and have shown and are showing their customary resource, courage, and enterprise, it is obvious that too many of us are still too insular and "superior" in ideas and manners, too self-satisfied with methods and traditions, too heedless of the march of events

and of progress and change in the world around us. Such an attitude is a survival from the earliest days of the Industrial Age, when we were the world's pioneers in mechanized industry and in foreign trade based upon it—the days before the Franco-Prussian War resulted in the birth of the German Empire and her modern industries; the days when the United States were fully engaged in the development of their own wonderful country, and had not begun to think of foreign markets for their goods; the days before Japan had emerged from the mists of her ancient history and brought her amazing industry and incomparable ingenuity to bear upon the production of goods for the world's markets.

Do not let me be mistaken. I am not suggesting for a moment that this attitude of insular superiority and condescension and of self-satisfied ignorance and apathy is common to all our manufacturers and merchants. We all know, and the Government's representatives overseas bear strong testimony to the fact, that there are many progressive export firms in this country whose knowledge of foreign markets and whose methods of selling in them are an example to the world. Were it not so, our export trade would not maintain even the reduced figures it shows, and the outlook would indeed be black. But there is all too much evidence on the adverse side of the balance-sheet for anyone to feel happy at its contemplation, and we should fail in our duty to the nation if we did not make the facts known, and endorse the warning of our world-travelled Prince that there is something d cidedly amiss in a good deal of our salesmanship. As he said, no good comes from patting ourselves on the back when candid criticism is an obvious, if unpleasant, duty. No one is decrying British goods, which are, as ever, the best that can be produced. It is all a question of our methods of selling them.

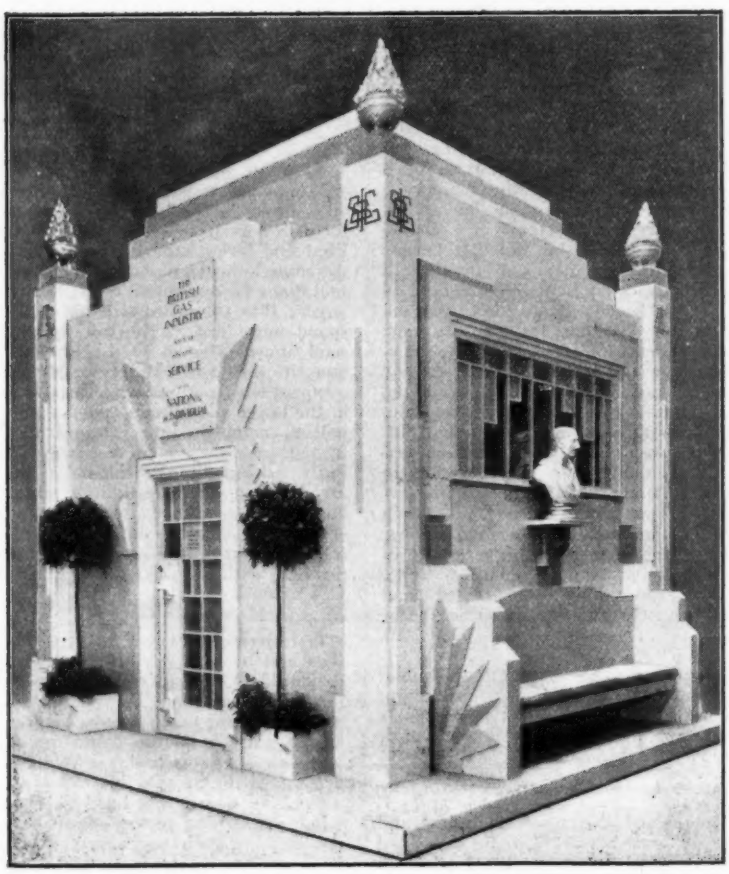
Mr. Goodenough announced that the criticisms that are very forcibly expressed from many quarters will be embodied and amplified, with evidence supporting them, in an Interim Report of the Committee as soon as all the replies to inquiries have been received. Some of the evidence already to hand was quoted by the speaker. One correspondent, for example, had written: "The efforts and enthusiasm of the best salesmen overseas are easily nullified by indifference or incompetence at headquarters . . . . The export manager should hold that deliveries on the promised dates are as important as his prayers. I have known endless trouble caused by the shortcomings of the export department at home." Mr. Goodenough concluded:

"The Customer is King."

Let us realize and act upon the truth that to-day, in the realm of Commerce, the Customer is King; and that to those who base their policy upon that truth the trade of the world will flow as naturally and surely as water to the sea. We no longer live in the spacious days of Queen Elizabeth when we captured the virgin markets of the world at the cannon's mouth; we are no longer in the golden days of Queen Victoria, when the output of British factories practically sold themselves the world over. Queen Elizabeth is dead! Queen Victoria is dead! We are living, and have to make our living, in the days of King George V.; we live in the strenuous, desperately competitive days of the monarch who, when Prince of Wales, after a tour of the world some 27 years ago, begged commerce and industry to "wake up"—advice that, judging by all the evidence that reaches your Committee, Lord Eustace, is needed on the commercial side almost as much to-day, when it is repeated in effect by King George's son at the Mansion House, as it was when it was uttered at the Guildhall in December, 1901.

If only our manufacturers will realize that the problem exists and has to be faced and solved, then the result is as certain as that the sun will rise to-morrow. British brains as well as British goods are equal to any competition they have to meet. All that is necessary is to get them applied to the problem that confronts us. It is a problem of literally vital importance, not only to the members of this Society, but to the very Empire itself; and our heartfelt thanks are due to the statesman with whose name I have now the honour of coupling this toast of "Our Visitors" for his appreciation of that fact, and for the practical steps he has taken to assist in its solution. I give you the health of "Our Visitors," coupled with the name of Lord Eustace Percy, President of the Board of Education.

Lord Eustace Percy replied; and then Lord Riddell proposed the toast of the Society, which was acknowledged by the Chairman of its Committee.



CENTRAL INFORMATION BUREAU IN THE GAS SECTION OF THE BRITISH INDUSTRIES FAIR.

JOINT GAS CONFERENCE.

BRITISH INDUSTRIES FAIR, BIRMINGHAM.

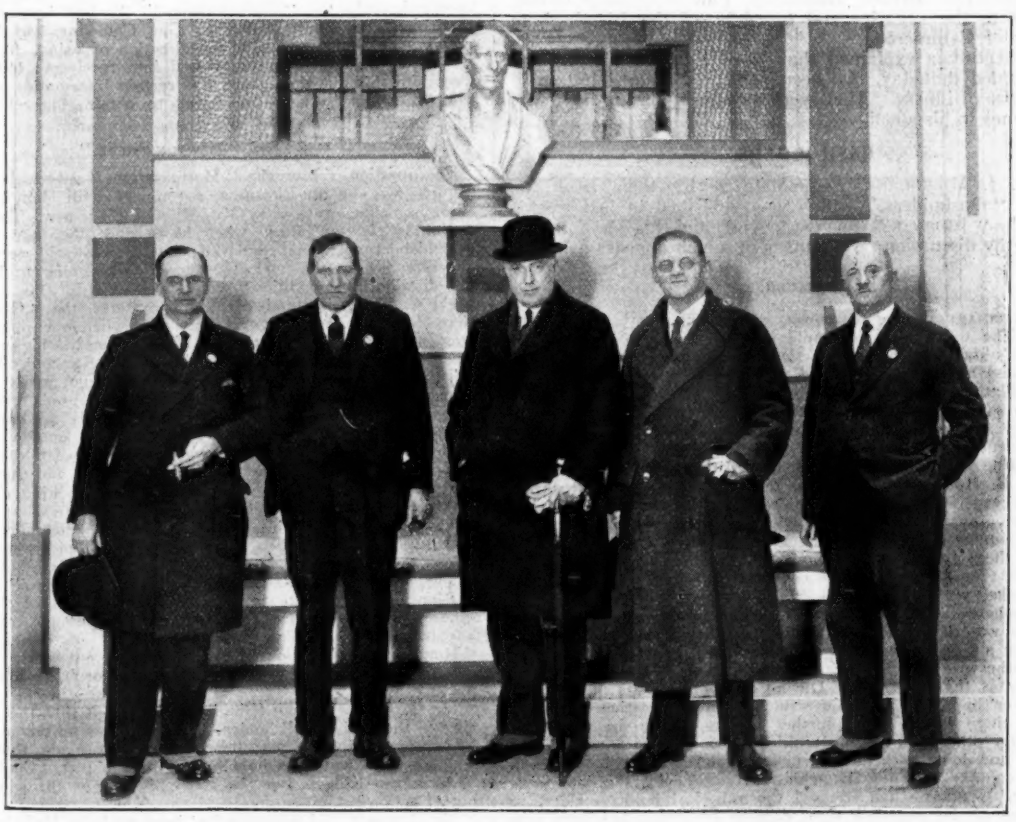
A Joint Gas Conference, under the Presidency of Mr. Frank H. Jones, M.Inst.C.E. (President of the British Commercial Gas Association), was held on Tuesday, Wednesday, and Thursday of last week at the British Industries Fair, Castle Bromwich, Birmingham. The conference was convened by the four national organizations—the Institution of Gas Engineers, the Society of British Gas Industries, the British Commercial Gas Association, and the National Gas Council—with Mr. H. C. Smith, M.Inst.C.E., as Hon. Secretary.

The first two mornings were devoted respectively to papers by Mr. R. J. Milbourne, Assoc.M.Inst.C.E., on "Gasholders" and by Mr. Stephen Lacey, B.Sc., Assoc.M.Inst.C.E., on "The Inspection and Maintenance of Gas Appliances." Mr. Milbourne's paper was published in last week's "Journal," and a report of the discussion is given below; while Mr. Lacey's contribution (with the report of the discussion upon it), will be found in the "Gas Salesman" Supplement accompanying this issue. The third morning was devoted to visits, following upon a lantern slide lecture by Dr. C. M. Walter, describing the gas heated industrial appliances which would be seen. The afternoons were set apart for an inspection of the exhibits in the Fair.

The abnormal weather conditions kept many at home who would otherwise have attended; but though the meetings were smaller than had been anticipated, the conference was voted a great success, and hopes were expressed that it would be repeated next year. All possible was done for the comfort of the visitors by the Fair Management Committee, whose guests they were at luncheon on the Wednesday.

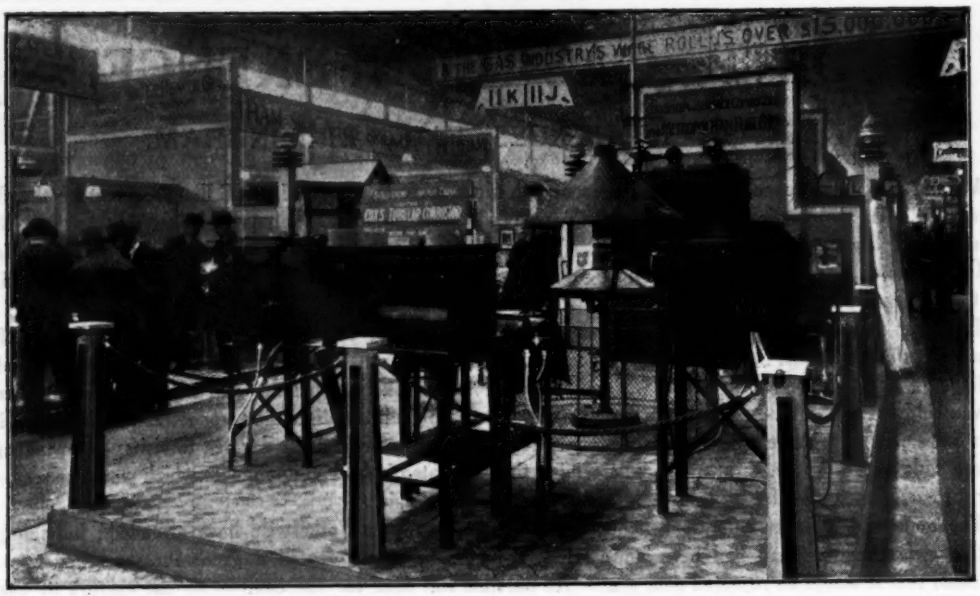
Alderman A. H. JAMES (Deputy Mayor of Birmingham), on behalf of the city, welcomed the delegates, in the absence of the Lord Mayor, whose engagements prevented his attendance. He said it was very fitting that such a conference, convened by the four most important gas organizations in the country, should be held in Birmingham, which might justifiably be described as the birthplace of the gas industry. It was a Birmingham citizen who, more than a hundred years ago, by research work and by the application of his inventive powers, laid the foundations of the great industry with which they were associated. The house in which Murdoch lived was recently demolished; and it was not to the credit of Birmingham that such a thing had been allowed. Everyone was impressed with the potentialities of this important industry, and he ventured to congratulate the Gas Industries Section of the Fair upon a very fine exhibit, and also upon the attractive scheme which characterized the display. One was tempted to ask where was the justification for the assertion sometimes made that gas was a "back number"—especially having regard to the enormous strides the industry had made in the directions of illumination and motive power. In the development of modern industry gas had played an important part; and from personal experience he could testify to the great use the Birmingham Gas Department had been to manufacturers in the city, in regard to research work, tests, and in general application of gas to manufacturing processes. One could readily understand that some factories were prevented by financial reasons from laying down the expensive plant which was required in research; and it was in this respect that the Birmingham Gas Department, and no doubt others, had contributed so largely to the development of industry where gas was needed.

Mr. R. C. RODGERS (President of the Birmingham Chamber



BENEATH THE BUST OF MURDOCH.

Reading from Left: Messrs. A. W. Smith, R. C. Rodgers, Frank H. Jones, F. W. Goodenough, and R. J. Rogers.



THE METROPOLITAN FUEL COMPANY'S DISPLAY.

of Commerce) said he believed those connected with industry, like the Fair authorities, realized that the exhibition was a strong effort to try to rectify the greatest curse the country had, which was unemployment. There was nothing they could do which would be of greater service to the country than to attempt to reduce unemployment.

The CHAIRMAN (Mr. Frank H. Jones), in acknowledging the welcome so heartily extended, said that Birmingham had always been looked upon as a leader in industrial gas matters; and he was glad to learn that illumination also was still well to the front, because there were people in the gas industry who had been rather inclined to regard lighting as slipping away from them. Anyone who had this idea should come to Birmingham, and see the very fine examples of gas lighting there. The whole gas industry regarded the Birmingham undertaking as an example to be followed. The officials had always been most generous in telling the world of what they had done. The British Industries Fair stood as a lasting memorial to the sagacity and foresight of the Birmingham Chamber of Commerce.

Mr. MILBOURNE explained that Lord Ednam, who was to have presided that day, had been prevented from doing so in consequence of illness. They were, however, glad to have Mr. Frank Jones in his stead.

GASHOLDERS.

Mr. R. J. MILBOURNE, Assoc.M.Inst.C.E., then read the paper on "Gasholders," which was published in last week's issue of the "JOURNAL" (pp. 523 to 533); and this was followed by a lengthy discussion, a summary of which appears below.

Discussion.

The CHAIRMAN said the paper was one which must appeal to all present. The only point he would like to raise had reference to the author's statement of the practical advantages of spiral holders. One of these advantages was said to be greater steadiness and reduced oscillation of pressure in high winds. He would be glad to hear from someone who had had the different types of holder working side by side as to whether this had been the actual experience. The President of the Institution of Gas Engineers, he believed, was experimenting with pressure holders, though they were not spherical.

Mr. R. B. HODGSON (Darlington) remarked that they all realized, from long experience, that the guide-framed holder and the spiral holder had proved to be very reliable structures, and he was quite sure any engineer present would have no hesitation in installing either of these types. Lately, however, there had been placed on the market two other types—one comparatively new to this country, and the other yet to be adopted. Both of these types—the tankless and the sphere—were novel in that they did away with the water seal. The waterless type had certainly made big strides during the last five or six years; and it must have many points in its favour, because otherwise the Americans would not have taken it up so extensively as they had done. During one of his visits to America, an engineer had told him that, from his own experience, he did not think there would be any further holders of any size erected in that country other than of the tankless type. America was almost dotted up and down with these structures, and he was glad to think that this country was now launching out into holders of the same type. Mr. Milbourne had stressed the spherical holder. Here, as in the case of the waterless type, English engineers had been conservative. He had been trying for eight or nine months, and Mr. Milbourne had been doing the same, but without success, to convert engineers to this pattern. Mr. Terrace had adopted something of the kind, but had not gone in for the sphere. However, he (Mr. Hodgson) was hoping that later on this country would come to the use of the spherical holder, as America had done. It was rather strange that they should follow the Americans in these matters, but it was a fact that in the States these spherical holders were in active service. There had been a good deal of discussion about the possibility of reducing the pressure reliably from 35 or 50 lbs. down to a working pressure of 5 or 6 in. People asked whether, in the case of a spherical holder, it would be practicable to guarantee this reduction being carried out in a satisfactory manner. He thought he could give such a guarantee; but he would like to hear what Mr. Milbourne had to say. If they could definitely promise that this reduction in pressure could be effected without fear of failure, he believed that in a very short time there would be engineers ready to adopt the spherical system, because of the advantages it possessed.

Mr. JOHN TERRACE said he felt the author had adequately covered the whole ground of gasholder construction and use, and had given a very good picture of the progress of the different types of holder. He would, however, be glad of some further information on the economies of the different types of holders which had been referred to—particularly the "Hortonsphere." As had been stated by the Chairman, the South Suburban Gas Company had been recently carrying out experiments in the direction of using, for the purpose of district holders, gas compressed into receivers; but before they went into this question, there was certain information which he had thought would be very interesting to obtain, but which he found extreme difficulty in securing.

THE "HORTONSPHERE."

The question of how the "Hortonsphere" was to be used in this country was, he must confess, not made at all plain by any of the advertisements, or even by Mr. Milbourne's paper. The author had made the clearest effort, when he set out the four general ways in which it could be employed; but it was still very difficult to understand how the "Hortonsphere" was going to be applied to the distributing conditions which prevailed in this country. One could readily understand why, in the States, the "Hortonspheres" were dotted up and down the country, when one remembered that most of the distribution there was by means of high-pressure: but when it came to using compressed gas in England, the conditions were different. He took it that there were not many cases in this country where the "Hortonsphere" could be used, attached directly to any system of distribution. He would like to know what size of "Hortonsphere" it would be economical to employ. There must be a limit somewhere in the comparison between the cost of the "Hortonsphere" *plus* the cost of compression, and that of the ordinary gasholder. This was a subject he was looking closely into at present; and he hoped before long to be able to give some definite information on the point. With regard to appearance, he did not think the "Hortonsphere" altogether deserved the complimentary things that had been said about it, because to his mind the ordinary holder looked quite as beautiful as a "Hortonsphere." In this connection, he would like to mention that the cost of the "Hortonsphere" should be very carefully compared with the cost of ordinary horizontal tanks, which could be put out of sight, whereas the "Hortonsphere" could not be, if of a decent size. How did the cost of the "Hortonsphere" compare with ordinary horizontal tanks for storage?

Mr. J. B. BALMFORTH (Bingley) pointed out that the author, referring to the "M.A.N." holder, said there was no escape of gas. He had understood, from a statement previously made, that the average leakage from waterless holders was over 2 p.ct. Could the rubber pads in the Klönne type be renewed without throwing the holder out of action?

Mr. TERRACE said reference had been made by Mr. Hodgson to the question of getting the pressure down from 50 lbs. to 5 in. He did not think that anyone need have the slightest uneasiness about that. It was quite easy to provide a safeguard against the governor breaking-down; but as one who had used this type of governor for

"MELTHAM" REFRACTORIES FOR ALL PURPOSES.

the last 25 years, he had no hesitation in saying that this difficulty did not exist at all.

Mr. J. FOSTER (Engineer-in-Chief to the Birmingham Corporation Gas Department) said that to his mind the great difficulty about the "Hortonsphere" was not in connection with the reduction in pressure, but in regard to the deposition of the hydrocarbons in the gas. They had been using in Birmingham, for the last 20 years, 15 lbs. pressure, and they had found that they did lose hydrocarbons. This difficulty had been overcome, but it had been a real one at the time. Now if they experienced deposition at 15 lbs., what was going to be the result at 50 lbs? "Hortonspheres" in America were principally used on natural gas, where there was not the same need to be careful about the deposition of hydrocarbons as there was in this country.

WATERLESS HOLDERS WORKING SATISFACTORILY.

Mr. J. W. SCOTT (Messrs. R. & J. Dempster, Ltd.) said it was satisfactory from the standpoint of the manufacturer that they had such a staunch champion as Mr. Milbourne. Under present conditions, owing to increasing day consumption for commercial uses, steadier load, and the aid of water gas, some gas-works were to be found carrying on with a 50 p.ct. overload, rather than provide a full day's storage. Except, therefore, in busy centres, the thoughts of the gas engineer appeared to be directed towards increased storage about once in ten years. Probably to-day they were all of them more interested in the new waterless and spherical holders than in the spiral and column-guided types. It was satisfactory to note from drawing No. 4 that in the "M.A.N." type both the upper and lower guide rollers were above the piston, and were amenable to examination, lubrication, and adjustment. Turning to drawing No. 6, they found that the lower rollers in the Klönne system were below the piston, which must have all the disadvantages of the old framed type, and seemed a backward step after experiencing the benefits of having the rollers above deck. In drawing No. 6, an elastic apron plate was shown; and as moisture often condensed upon the interior of the shell plates, it occurred to him that such moisture would be stripped-off by the packing rings as the piston rose, and be collected in the space between the shell and apron plate. Under present conditions there would be considerable trouble owing to formation of ice. Provision was made, where a tar seal was employed, to separate the water automatically from the tar before the pumps returned it to the distributing tanks. The same illustration also showed the space for the lubricant between the packing rings; and he was afraid on the south side of a Klönne holder during the summer the lubricator would require constant attention, and owing to the freer movement on that side the piston might tend to get out of level. Mr. Milbourne said the rubber pads were fitted with a system of automatic lubrication which only required replenishing at long intervals, and that it protected from corrosion the inside of the cylinder, so that painting was unnecessary. If this was the case, his own view was that constant replenishing of the lubricators would be needed, if such a huge area as the inside of the shell had to be so treated. This would be much more costly than the electric current used in returning the tar for this purpose in the "M.A.N." type. Already in this country the waterless gasholder had passed through two summers, and given complete satisfaction; and although they were at the present moment having records established for cold, the three waterless gasholders in opera-

"CANNON" PRODUCTS.

TO ASSIST THE LIGHTING LOAD.

tion respectively at Ipswich, Staines, and Woodford were standing up to the trial without any difficulty. One of the advantages of the "M.A.N." type was that the piston was designed to give up to 20 in. pressure by the addition of concrete blocks. The author did not refer to this, or point out how it was carried out in the Klönne system. He would also be glad to know what was the difference in pressure thrown between rising and falling. Further, he was curious to know whether any means was adopted to prevent the piston turning round; for it was said in the paper that the interior of the shell was smooth and circular.

OBSERVATIONS ON FOUNDATIONS FROM STAFFORD.

Mr. T. H. POULSON (Stafford), who was prevented from attending the conference, forwarded a few observations upon the paper, which were read by his representative. In the course of these, he said that it appeared to be the practice to build waterless gasholders much higher than the ordinary types; and this might prove an objection in many districts. It certainly would be so in Stafford. Would it not therefore be possible to increase the diameter and reduce the height? When the sail-cloth had to be renewed, how long would (say) a 2 million c.ft. waterless holder be out of action while this renewal was taking place? This detail seemed to be of vital importance; and he presumed it would be necessary to stock a complete set of sail-cloth for any sudden emergency. It appeared also that the replacement would be a very dirty and tiresome job, as every bolt, nut, and other part would be covered by tar. In a paper read before the Australian Gas Institute last year, Mr. C. F. Broadbent, of Melbourne, speaking of the holders at the Chicago Gas Company's works, said: "There are two 10 million c.ft. holders and a 15 million c.ft. waterless holder in the district. No general trouble has been experienced with the latter; but there is much vibration in the holder, probably due to pumping, and the tar has to be heated in the winter time." Did Mr. Milbourne hold the view that the vibration was caused by pumping? With regard to foundations, although the total load on the foundations might be less than that of a tank holder, the pressure per square foot on the outer ring of concrete supporting the waterless holder appeared to be about the same as for an ordinary holder. At Stafford, for instance, although practically the whole of the gas plant foundations were piled, they had abandoned the use of piles in the foundations of their 1 million c.ft. holder, and simply reinforced the outer edge of the concrete slab, constructing it in the form of an inverted saucer, in order to carry the weight of the tank side plates and the lifts when the holder was landed in the tank. Although the ground was of a very soft, yielding nature, the settlement had been very even, and the inexpensive foundation has proved quite satisfactory.

BOTH WATERLESS TYPES SATISFACTORY.

Mr. H. J. ANDREWS (Langley Mill) said he had been told by his brother, who had been visiting Germany, that both types of waterless holder were giving great satisfaction there. With reference to the question of lubrication, he said that when the Klönne type was first introduced, this presented a difficulty; but they had now succeeded in getting a lubricant out which was satisfactory within practically any range of temperature likely to be met with.

Mr. SAMUEL CUTLER, on being called on, said he would prefer to listen to the opinions of more gas engineers on this important subject.

THE AUTHOR REPLIES TO POINTS RAISED.

Mr. MILBOURNE expressed his gratification that the paper should have led to so much discussion. He said he thought it was generally understood that in a very severe gale the spiral holder was much steadier and gave less oscillation than the ordinary guide-framed holder. In a measure this could be accounted for by the fact that with the guide-framed holder a definite number of the roller carriages pressed upon the guides; but in the case of the spiral holder a greater number of rollers came into action under wind pressure than would theoretically be supposed. Owing to the flexibility of the structure, a very large number of rollers came into action; and he had known of cases in which as large a proportion as 80 p.ct. of the total rollers had been in operation in a gale. As to the "Hortonsphere," this would operate down to (say) 5 in. quite easily. There could be no possible doubt about this. He was sorry it was impossible to give Mr. Terrace information with reference to economics. He did not think the general public had any overpowering objection to gasholders on the score of beauty. Why they disliked a holder being brought into their immediate neighbourhood was because they feared the consequences of an explosion. This fear was to a great extent fostered by the lay Press. With the early type of "M.A.N." holder, he thought there were leakages of gas; but this trouble had since been successfully overcome. The rubber pads formed the seal of the Klönne holder; and the holder would have to be out of action when this seal was being renewed. He had no wish to dispute the statement made by Mr. Foster as to the deposition of hydrocarbons from gas at 15 lbs. pressure; but Americans had declared that, by compressing the gas up to 30 or 50 lbs., one actually improved it. Whether or not this was a fact, he must leave others to decide.

Whatever type of holder was used, he contended that it was absolutely necessary to give it more attention than usual during such frosty weather as had been recently experienced. With regard to the vexed question of the proper relation of storage to consumption, his own opinion was that a full day's storage was not now necessary. Indeed, he thought most engineers would be quite satisfied with storage equal to three-quarters of a maximum day's output of gas. It had been mentioned that the temperature would affect the lubricant. Unfortunately it did the same to tar; and until tar could be rendered of the same consistency winter and summer, he was afraid there would continue to be trouble. Mr. Scott had asked whether any means was adopted for preventing the piston from turning round in the Klönne type holder. The designers of this holder had included no such means, as it was found to be one of the great advantages of this particular form of waterless holder that the piston did actually rotate somewhat in ascending and descending. The result of this was that the rollers did not always bear upon the same part of the structure. The pressure on the outer edge of the foundations of a waterless holder, it seemed to him, must almost in any case be greater than with a guide-framed or spiral holder. In addition to the complete weight of the structure, one must not lose sight of the fact that it was necessary to provide holding-down bolts, in order to withstand the overturning moment of the wind. It was problematical whether there was going to be any great saving in this direction in the tankless as compared with the ordinary type of holder, unless where the ground was extremely soft, and piling had to be resorted to. It would then be only necessary to pile the outer edge. He was inclined to agree with Mr. Poulson, that they were apt to put in more elaborate foundations than were necessary for even the ordinary type of holder.

Passing on, he remarked that he was unable to say that he had observed any such vibration as had been referred to in the case of the tankless holder. If it existed, he should not consider it was due to the working of the electric pumps, but to wind pressure. He had been asked how long it would take to renew the sail-cloth. Mr. Prentice, he believed, had given the time as twelve hours; while Messrs. Cockey put it at two days. He (Mr. Milbourne) would imagine that the latter would be about the time it would take. It had been interesting to hear Mr. Andrews declare that both types

of waterless holder, which were extensively used in Germany, had proved satisfactory, and that the lubricant in the case of the Klönne holder now gave no trouble.

TWENTY-FOUR HOURS' STORAGE.

Mr. HUBERT POOLEY (Leicester), proposing a hearty vote of thanks to the author, remarked that with everything that had been said in the discussion he did not think all present would be in agreement; but the paper itself was a most interesting historical survey of the problem of storage. He did not agree with Mr. Milbourne as to the proper relation between storage and maximum day's output of gas. He felt it was necessary to say this, because he thought Mr. Milbourne's figure of three-quarters of the maximum day's output should not go forth as a general expression of opinion at the present time. In the case of an undertaking like his own at Leicester, with a minimum hourly consumption of 75,000 c.ft., and a maximum of 1,500,000 c.ft., the storage must of necessity be equal to the maximum day. ["Hear, hear"]; and he was at present providing for this very state of affairs. Preferably he would like storage equal to 1½ days' maximum output.

Mr. D. H. HELPS (Reading) said he also had been surprised to hear Mr. Milbourne say that gas engineers would now consider storage equal to three-quarters of a maximum day's consumption sufficient. He himself would much prefer to have 24 hours' storage. With regard to the tankless holder, given confidence in the continuous stability of the seal, he could not conceive a more simple method of storing gas. It was, however, the seal that made him just a little bit anxious even now.

A SUGGESTION.

He (Mr. Helps) would like to suggest that some kindly disposed person might throw his tankless holder out of use, so that they could ascertain definitely (whether it actually required renewing or not) how long it would take to remove the sail-cloth and replace it. The expense of gaining this knowledge might be pooled. To-day if anyone offered him a holder of any type he liked at the same price, he felt he would be greatly tempted to favour his old friend the standard holder—especially after hearing the last lines of the paper: "Doubtless the design will still further develop; and this class of holder may eventually win the same degree of security and confidence in working that has characterized the guide-framed or spiral holder over a long period of time." Personally, he thought the tankless holder had come to stay, but it would probably be improved.

Mr. MILBOURNE (acknowledging the vote of thanks, which had been passed with acclamation) said he would be extremely gratified if all engineers would adopt as a standard for storage 24-hours' maximum output; but he found that this standard, though highly desirable, was unusual. It seemed difficult to persuade Directors or Committees to adopt it.

ALDERMAN LLOYD'S INDISPOSITION.

The CHAIRMAN announced the receipt of a letter from Alderman J. H. Lloyd, the Chairman of the Birmingham Corporation Gas Committee, regretting his absence, which was caused by indisposition. The Hon. Secretary would convey to Alderman Lloyd a message of sympathy and of hope for a speedy recovery.

IMPORTANCE OF CHEAPER STORAGE.

Dr. E. W. SMITH, proposing a vote of thanks to the Chairman, said that, as the holders of a gas undertaking cost nearly as much as the carbonizing plant, it was very important to consider how they could be reduced in price. If new types of holders could be produced to give results equal to the old ones at a much less cost, it would be a good thing for the industry. As to the "Hortonsphere," it would be an expensive matter to put in governors which would regulate satisfactorily at a constant outlet pressure, down from (say) 30 lbs. to 5 in. Taking all things into consideration, he did not think it would be worth while installing such holders.

The vote of thanks was seconded by Mr. CHARLES CLARE, and acknowledged by the CHAIRMAN.

INSPECTION AND MAINTENANCE OF GAS APPLIANCES.

The CHAIRMAN, when the proceedings of the conference were resumed on Wednesday morning, introduced Mr. Stephen Lacey, who was to read a paper, and said he was sure everyone present would wish to express sympathy with Mr. Lacey in the anxious time he had been recently passing through. ("Hear, hear.")

Mr. STEPHEN LACEY, B.Sc., Assoc.M.Inst.C.E., Distributing Engineer to the Gas Light and Coke Company, then read a paper entitled "Inspection and Maintenance of Gas Appliances." The paper, and a report of the lengthy discussion by which it was followed, will be found in the "GAS SALESMAN" Supplement to this number of the "JOURNAL."

ACKNOWLEDGMENTS.

Mr. W. M. CARR (Stretford) proposed a hearty vote of thanks to Mr. Lacey for a paper which contained so much valuable information.

Mr. ROBERT WATSON (Doncaster), who seconded, said that, as one who had been very considerably interested in gas lighting, he was glad that the author had included in his paper some references to this phase of the industry's work. He was also pleased to hear in the course of the discussion so many allusions to the endeavours being made to retain it.

The CHAIRMAN moved a vote of thanks to the Birmingham Corporation, to the Gas Committee, and particularly to Mr. A. W. Smith and Mr. R. J. Rogers, for all they had done to make the conference so great a success. He felt that their thanks were also due to many others. While he was a very great believer in gas, it must always be remembered that the future of the industry was in the hands of the industry itself. It was up to the small undertakings just as much as to the large ones to help the industry forward. He hoped that conferences of this character would continue.

Mr. A. W. SMITH, in acknowledgment, remarked that their thanks should really go to Mr. H. C. Smith, who had acted as Hon. Secretary; but anything which they in Birmingham had done they had been only too pleased to do. For most of it Mr. Rogers had been responsible. The Fair Committee, too, had provided special accommodation for them.

On the proposition of Mr. JOHN TERRACE, the Chairman was thanked for presiding.

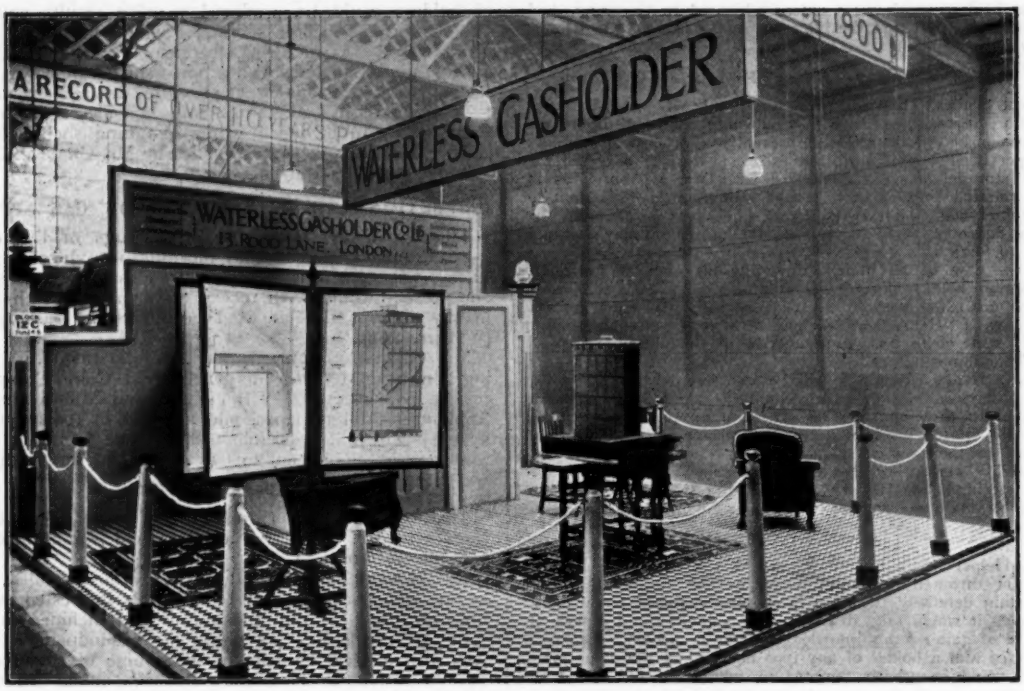
GUESTS OF THE FAIR MANAGEMENT COMMITTEE.

There was a large attendance for luncheon in the Royal Dining Room, by invitation of the Fair Management Committee.

Mr. R. C. RODGERS (President of the Birmingham Chamber

OVER 100,000 MEN ARE EMPLOYED IN THE GAS INDUSTRY
Bray Burners.
GEO. BRAY & Co Ltd LEEDS.
RENOWNED BRAY BURNER
BRAY
MEMBERS OF THE LEEDS CHAMBER OF COMMERCE

MODERN GAS LIGHTING.



A SUBJECT DISCUSSED AT THE CONFERENCE.

of Commerce), was in the chair, and submitted the toast of "The Gas Industry."

BRITISH CAPITAL FOR THE BRITISH GAS INDUSTRY.

Referring to the magnitude and importance of the gas industry, he expressed the hope that in seeking further capital they would not go outside the sterling area. Oen of the primary purposes of gas was to provide driving power. What they were looking for in this country was driving power for the workpeople. He suggested that the finest driving power they could have was plenty of orders. Every purchase of British goods was helping to increase national optimism, and was giving hope to some district where there was little hope now. He trusted that year by year they would welcome at the Fair more and more persons connected with the gas industry.

Mr. FRANK JONES, responding, agreed with what had been said upon the question of British capital for the gas industry. He could tell them that other "coin" had tried, and was trying very hard, and in very determined manner, to get into the industry. There were cases in which very substantial overtures were being made to get control in the industry. He was a Britisher, and it had been suggested to him that he should be a stalking horse to help other than British money to come into the British gas industry. That might have been very largely to his own advantage; but he hoped that if any one of them was approached, they would do as he (Mr. Jones)

VISITORS AND THEIR HOSTS.

did, and say "No." He hoped the buyers would go for British goods for British gas companies.

GAS IN INDUSTRY.

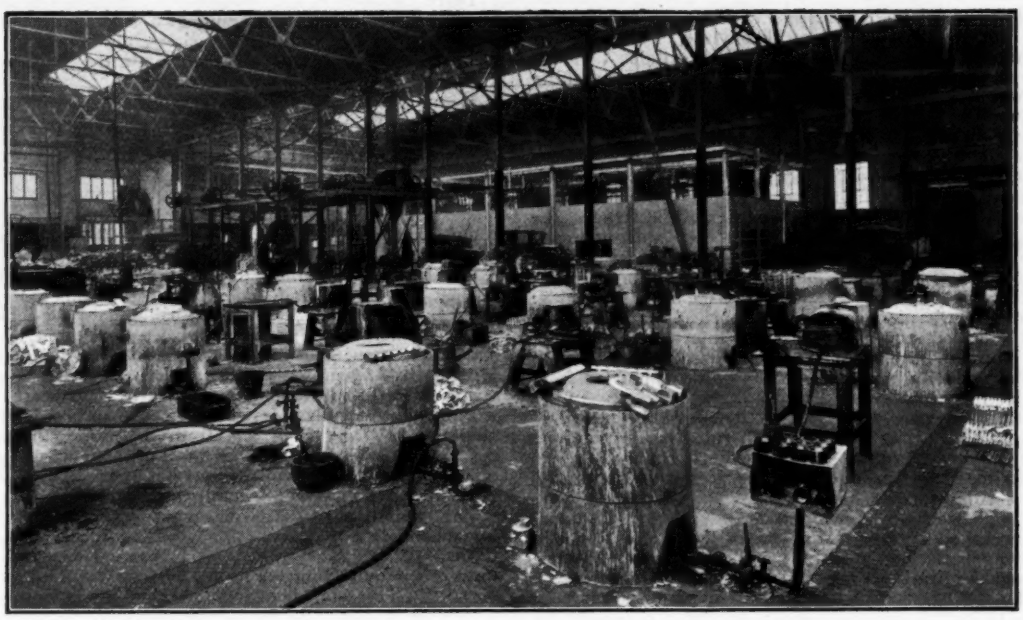
Birmingham is celebrated throughout the country for its large applications of gas to varied industrial operations; and on the third day of the conference the visitors were, by the courtesy of the firms concerned, permitted to inspect some particularly interesting examples, illustrated descriptions of which follow. Before a start was made, those attending the conference assembled in the Birmingham and Midland Institute, where, under the Chairmanship of Mr. John Terrace, M.Inst.C.E., a lantern slide account was given by Dr. C. M. Walter of the gas heated industrial appliances in use at the works to be subsequently visited.

WORKS VISITED.

MESSRS. F. H. ADAMS (1926), LTD., HANDSWORTH.

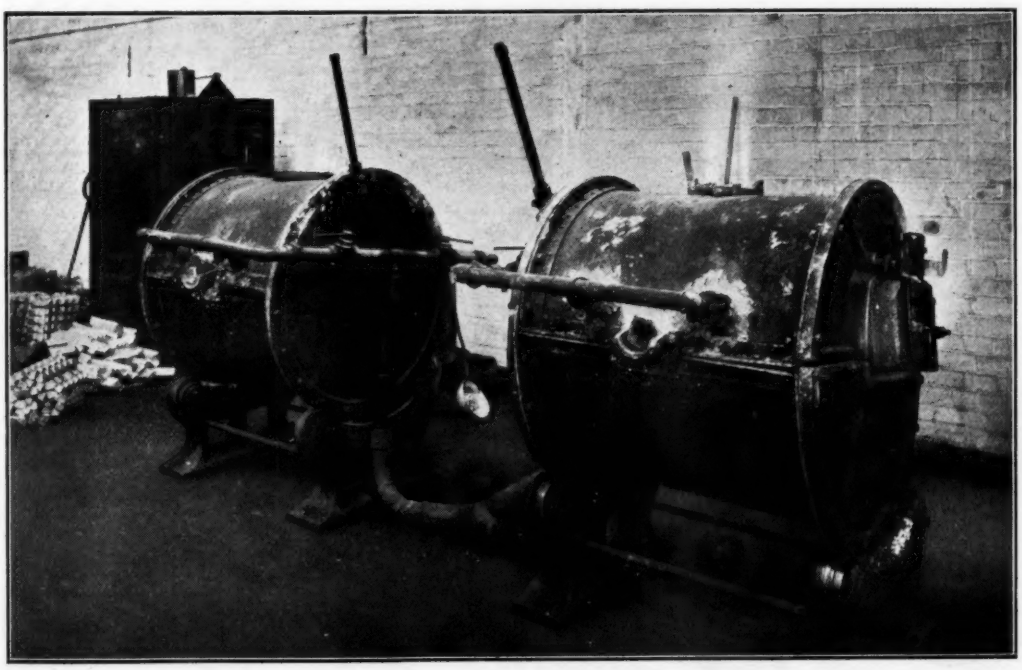
The use of town gas for the various melting, die-heating, and heat-treatment processes connected with the production of die castings, and the history of Messrs. F. H. Adams (1926), Ltd., have been closely allied. This firm were among the earliest manufacturers of aluminium castings for domestic and industrial purposes to make use of the modern process of die casting.

In 1918 the Birmingham Gas Department were approached by Mr. Collyer (Managing Director of Messrs. Fred. H. Adams, Ltd.) to submit a scheme of gas heating for melting aluminium in bulk to feed small re-melting pots, which in their turn fed the die-casting machines. The re-melting pots were to be



GENERAL VIEW OF THE DIE-CASTING SHOP OF MESSRS. F. H. ADAMS (1926), LTD.

Showing a battery of gas-heated re-melting furnaces for aluminium, fitted with high-pressure gas equipment. A number of die-heating burners will also be observed.



TWO GAS-HEATED ALUMINIUM MELTING FURNACES AT MESSRS. F. H. ADAMS (1926), LTD.

These furnaces melt aluminium alloy in bulk. They are fitted with burners supplied with gas and air mixture from machines made by the Selas Gas and Engineering Company.

fitted with gas burners to maintain the metal in a molten condition. Further, suitable heating arrangements were to be made for dies to be heated prior to and during their use. From the experience which had been gained up to that time, it was decided that gas under a pressure of about 10 lbs. per sq. in. was the most satisfactory method of heating for this installation; and there being no gas supply available at this pressure from the mains in that part of the city, it was necessary for Messrs. Adams to instal compressors to boost the gas as supplied from the low-pressure main. From the compressor the gas was carried along a main pipe-line with suitable tappings for the large furnaces. Rails feeding the smaller re-melting furnaces and burners for die-heating were laid in troughs in the flooring; supplies being brought up from these rails to each burner point as required.

The bulk melting of aluminium in alloyed ingots was dealt with in large cast-iron bowl-shaped pots, the tops of which were at floor level to facilitate the ladling operation. These furnaces consisted of well-constructed brickwork settings, the inner linings of which were shaped to the pot, and rough-cast with broken brickwork and ganister so as to offer as large a refractory surface as possible. The smaller re-melting furnaces were constructed in a similar manner. The burners used in each instance consisted of a chamber burner head with top plate suitably drilled, and a well-designed injector; the number of burners in use and the volume of gas allowed to pass through the jets being adjusted according to the work demanded from the particular furnace.

This installation gave every satisfaction until the period of comparatively high prices for gas which ruled in Birmingham after the war, when Messrs. Adams reluctantly changed-over to oil fuel. In 1927 more favourable gas prices were obtaining; and Messrs. Adams, who had by then outgrown their comparatively small works in New John Street, planned an extensive new works on a site at Middlemore Road, Handsworth, when it was again decided to use gas as the main heating agent. This followed the firm's reconstruction as F. H. Adams (1926), Ltd. In the short period of its existence this works has been brought up to its full capacity, and it has been necessary for extensions on a very large scale to be undertaken on the other side of the road.

The plant to be seen on an inspection is probably one of the most complete and self-contained to be found in any modern die-casting works, and covers a wide field of industrial activity; every process being provided for incidental to the production of high-grade die-casting, from the necessary die-making to the finished article. A meter, with a capacity of 10,000 c.ft. per hour, registers the gas required by this firm, and at the time of writing it is interesting to note that it has become necessary to increase the meter capacity. An 8-in. main carries the gas to the compressor house, where it is boosted up to 7 lbs. per sq. in. by compressors made by Messrs. Reavell & Co., of Ipswich. This gas is fed to the small re-melting furnaces of the design already described, the die-heating burners, and the pressure casting machines—the latter an interesting recent development for the production of high-quality castings.

There are also in the compressor house two Selas gas and air mixing machines supplying two rotary melting furnaces each of 3 cwt. (aluminium) capacity, also made by the Selas Company. These furnaces deal with the bulk melting of aluminium to feed the smaller furnaces.

Messrs. Adams also have several gas-heated heat treatment furnaces in use.

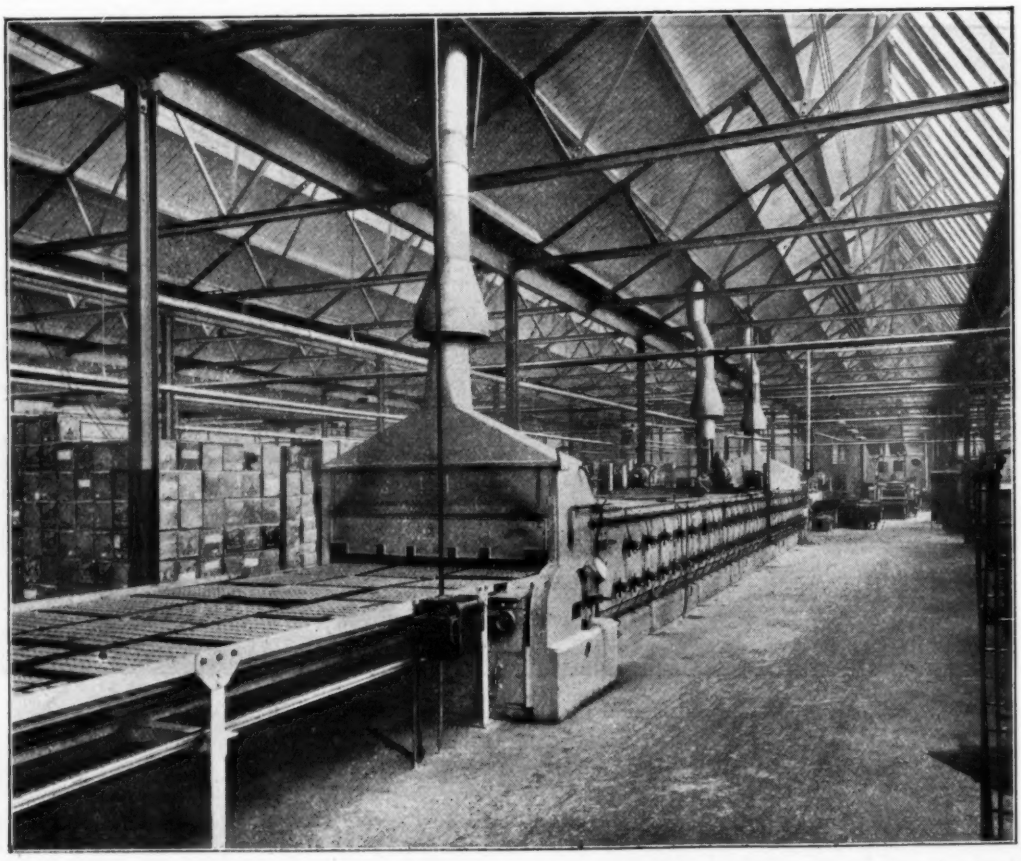
MESSRS. ALFRED HUGHES & SONS, LTD., ADDERLEY PARK.

Messrs. Alfred Hughes & Sons are rapidly obtaining recognition as one of the foremost firms in the manufacture on a large scale of biscuits and cake of a very high quality.

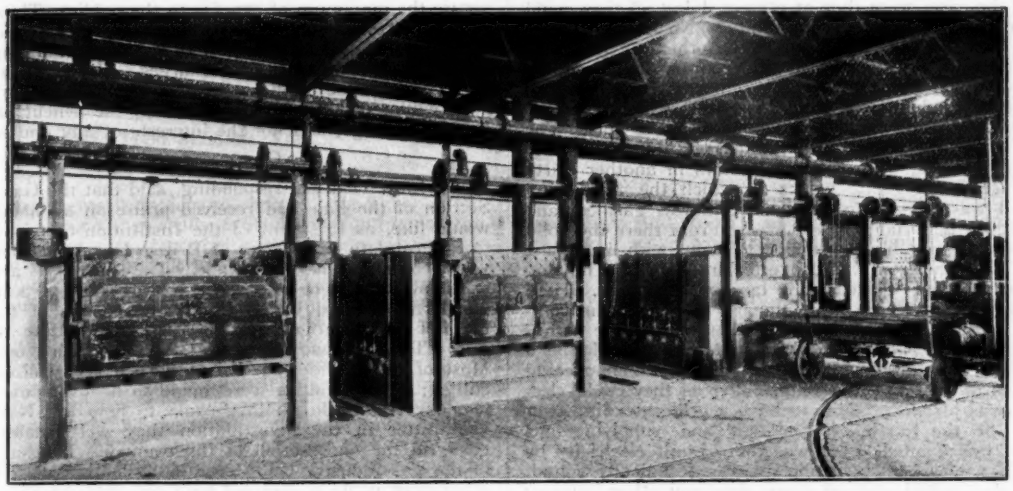
The heating operations up to 1921 had been mainly carried out by means of solid fuel. About this time, Mr. Howard Hughes collaborated with the Birmingham Gas Department with a view to adopting town gas as a fuel in one biscuit oven. This gentleman, in company with Dr. C. M. Walter and Mr. R. G. Marsh, representing the Birmingham Gas Department, visited a works in Manchester at which a gas-heated oven was working successfully. It was decided to proceed with the installation at Dale End, and from that time, throughout the developments already referred to at the old works and at the new Adderley Park premises, gas has been (and, as far as can be seen at present, will remain) the principal heating agent.

The equipment of the biscuit-making plant, comprising mixing machines, conveyors, and ovens, is, in Mr. Hughes' own terms, "A standard lay-out—no more, and essentially no less, than other manufacturers would possess, working on a similar output." This statement signifies that the equipment is completely up-to-date. So far as the ovens are concerned, the old brick construction is completely a thing of the past, being replaced by modern ovens which, in the case of those removed from Dale End, have been re-designed and re-conditioned, making them equal to the new ovens recently installed. These ovens are now completely portable, and could be taken down and re-erected for working in about two weeks.

The main biscuit equipment consists of two 50-ft. and one 40-ft. Baker-Perkins biscuit ovens, heated by town gas supplied at a pressure of approximately 6 in. mercury, by means of Keith-Blackman compressors, to burner equipment also sup-



DISCHARGING END OF A 50-FT. BAKER-PERKINS GAS-HEATED BISCUIT OVEN.



A BATTERY OF GIBBONS CARBURIZING FURNACES INSTALLED IN THE HARDENING SHOPS AT THE NEW FACTORY OF THE MOSS GEAR COMPANY, LTD.

plied by the Keith-Blackman Company. In the case of the 50-ft. ovens, with an average gas consumption of 2200 c.ft. gas per hour, an output of 4 to 5 cwt. of biscuits is obtained in the same period, the variation in output being due to the different classes of biscuits which are put through. One of these ovens, which was running at the Dale End premises and has been brought up to date for the new works, has been running for a total period of seven years. The 40-ft. oven is six years old, and with a gas consumption of 1600 c.ft. per hour gives a varying output, according to goods, of 3 to 4 cwt.

Messrs. Hughes have also installed a wafer machine, again made by Messrs. Baker-Perkins Limited, with Keith-Blackman high-pressure gas equipment, consuming about 600 c.ft. of gas per hour, and producing wafers which are eventually made into cream wafer biscuits. It is also interesting to note that at Dale End Messrs. Hughes had one steam-pipe baking oven for cake and sponge goods, which was heated by solid fuel. As the firm were particularly anxious, in removing to new works, to avoid solid fuel, and the dirt and dust inseparable therefrom, it was decided to convert this oven to gas heating; and after a six months' run, Messrs. Hughes express complete satisfaction with the working of the oven and the quality of the produce.

No article referring to the heating equipment of the new works at Adderley Park would be complete without reference to the very well-equipped canteen in which are fitted modern types of gas cooking, water-heating, and meal-warming appliances. It is understood that of the 500 staff and workpeople who are employed, 300 take advantage of the facilities provided by the firm for the supply of a cooked meal daily.

A tour through the chocolate-biscuit covering plant, packing and despatch rooms, and lastly the showroom, completes a visit to these works, which one leaves feeling that he has inspected a factory not only up-to-date in the character of its equipment, but with a master hand and brain controlling its every activity.

THE MOSS GEAR CO., LTD., OF TYBURN.

The Moss Gear Company is a firm well known to all connected with the motor industry, and specializes in the manufacture of gears, camshafts, and components used in this industry. The firm started in business in a very small way in 1910 at Aston, Birmingham; the original works consisting of a small shed 75 ft. long by 45 ft. wide, which premises were taken on a 3 years' lease for the manufacture of camshafts and gearing for the motor trade. The ever-increasing demand for components of this kind led to considerable extensions at their old works; and just prior to the war the Company had made a speciality of aero camshafts and special gears, after having carried out much experimental work in this direction.

During the war they were engaged upon many important contracts for the various Services; and owing to the demand for the particular class of work, the business developed with extraordinary rapidity, and has continued to do so since. With the continual extensions taking place at the old works at Aston, the equipment of the hardening shops was periodically extended and brought up to date, with the result that prior to their moving to the new and still more extensive premises, their gas consumption for industrial purposes alone approximated 42 million c.ft. per annum.

The major portion of the gas used for industrial purposes at these works was in connection with carburizing and re-heating of motor components. For this purpose, eleven furnaces of considerable dimensions, several of which were of the most modern types, were in continual operation during 24 hours per day. Four of these were designed and installed by Messrs. Gibbons Bros., Ltd., of Dudley, for carburizing purposes; and it is interesting to note that the Moss Gear Company have, for a number of years, adopted town gas in favour of solid fuel in their hardening shops, after going very carefully into the relative cost and taking into consideration the quality of work produced by both systems. The new works which will be visited are situate at Tyburn, and occupy approximately 180,000 sq. ft. of floor space, as compared with the 80,000 sq. ft. which their old premises covered just prior to their removal.

In the new heat-treatment shops, it is intended to instal eventually a battery of eighteen large Gibbons furnaces for carburizing purposes, four of which have already been completed and are now working continuously. A further two units of the most modern design are about to be erected, and the results of tests carried out on this particular type of furnace indicate that the fuel costs of carburizing will be reduced to the absolute minimum. The lay-out of the new works is of particular interest, and represents perhaps an ideal scheme from every point of view, the whole of the factory being on the ground floor. The Company also intend fitting up a canteen with the most modern gas appliances, and it is expected that the total gas consumption at the works will approximate 100 millions per annum.

To supply the furnaces, a 14-in. cast-iron service pipe is laid from Chester Road to the meter house, in which is fixed a 5000-light wet meter, complete with by-pass valves. Adjoining the meter house is the booster house, in which are fixed two Keith-Blackman N.G.2 fans, which are belt-driven by two independent electric motors. The drive consists of Whittle triple "V" belts. The fans run at a speed of 2850 R.P.M. The capacity of each is 30,000 c.ft. per hour, and by them the pressure is raised to 12 in. of water above the pressure at which gas is delivered. The system of control valves is such that one or other of the fans may be used as required; and from the fans the gas is delivered to a 12-in. cast-iron outlet pipe which runs underground a distance of about 250 ft. to the hardening shop. At the point where this pipe enters the shop, it rises vertically to the level of the tie-rods, and is then carried overhead across the shop and along over the battery of the existing four furnaces. A 4-in. branch supply drops down to floor level, and at this point 4-in. governors are fixed, each of which controls the supply to two furnaces. The governor reduces the pressure to 4 in. of water, at which it is delivered to the burner nipples. In this manner it is possible, whatever the pressures may be in the system of mains, to maintain constant pressure day and night at 4 in. of water to the furnaces, and the capacity of the fans and outlet pipes is such that they are capable of handling any volume up to 30,000 c.ft. per hour.

CLOSING LUNCHEON.

The conference closed with another well-attended luncheon at the British Industries Fair.

"THE GAS INDUSTRY."

Prof. F. W. BURSTALL, M.Sc., M.A. (Vice-Principal of the University of Birmingham), proposing the toast of "The Gas Industry," said it was far too modest. The industry did not seem to have realized that the public constantly wanted to be told of the goods which were offered; and their particular industry was in a position to "lick creation." He need hardly say that this matter was very well understood by another section of public utility suppliers, who never failed to impress upon the public the value of their goods. A lot more publicity would be very much to the good of the community and of the gas industry. It was not too much to say that gas was the ideal fuel, and that it could never be beaten, no matter what changes science might introduce.

This being the case, were they at present doing all they could to facilitate the work of the community? No industry stood by itself. Each was dependent upon the others.

One of the industries in which this country had been the pioneer, and which was now tending somewhat to slip away, was that great industry of iron and steel, which required in the course of manufacture large quantities of fuel. The same was true of many other industries. He wanted to visualize, if he could, the position of affairs in another thirty years. Imagine a gigantic works in which the first thing that entered was the raw coal. This coal was gasified, and solid and liquid material was left over. From there the solid material passed to the blast furnaces, to form, with limestone, pig iron. Then the iron was converted into steel. The slag was ground up and treated with tar for the roads. Here they had something which was intended to benefit the community as a whole; and he suggested that when these manufacturing processes had been carried out, there would be a considerable residue of gas for other purposes. They could transmit gas as far, and as economically, as they could electricity. It was just as possible to have a grid extending over the whole of the North of England, and supplying gas wherever it was wanted, as it was to transmit electricity by high-tension cables. Such a scheme was technically sound. The gas industry had suffered more than any other industry from the peculiar attitude of the Legislature towards it. This must be changed. He saw no reason why the gas industry should not be free to raise its capital where it liked, to make what profits it liked, and to distribute its commodity under restrictions not more onerous than those which applied to any other industry. He thought they must look forward, whether they liked it or not, to the time when they would be controlled by a new body, which he ventured to call the Gas Commissioners, who would be entrusted with the same powers as the Electricity Commissioners in the way of amalgamating and co-ordinating the various manufacturing stations in order to secure the maximum of benefits to the public. They could not go on unless they had a co-ordinating system which enabled them to manufacture their product at a minimum of cost, and to cut-down the overhead charges. He felt the time would come when these public utility services must be co-ordinated and regulated with one end in view—the benefit of the community at large, and not the interests of any one section.

CONGRATULATIONS.

Mr. JOHN TERRACE, responding, said that the Gas Industries Section of the Fair had received praise on all hands; and he would like, as President of the Institution of Gas Engineers, to congratulate the Society of British Gas Industries upon the very good show they had made. The scheme as a whole was excellent; and there must be a special word of praise for the wonderful Bureau which formed the centre of the Section. He felt that the gas grid was something like the electric grid. The less one heard about it, the more one liked it. Most of them who went below the surface realized the difficulties; but difficulties were made to be overcome, and they would certainly do all they could to help the National Fuel Committee in the investigation they were making of the gas grid for one section of the country. The suggestion as to the gas industry being eventually controlled by Gas Commissioners would be received with very mixed feelings. Speaking personally, he would say: "If you do not like the suggestion of Gas Commissioners—and I take it most of you do not—the prevention of it lies very largely in the industry's own hands." He fancied he could discern movements in the gas industry which would go a long way towards making the service rendered to the community so satisfactory that the appointment of Gas Commissioners would be unnecessary. He was glad to hear that so far this year the success of the Fair had been even greater than before. The members of the conference highly appreciated all that had been done for them during their visit to Birmingham.

ASSOCIATION OF PUBLIC LIGHTING ENGINEERS.

Meeting at the British Industries Fair, Birmingham.

In connection with the Joint Gas Conference at the British Industries Fair, a Luncheon was held in the Conference Hall of the Exhibition under the auspices of the National Gas Council, the Institution of Gas Engineers, the British Commercial Gas Association, and the Society of British Gas Industries on Thursday, Feb. 21, at which the members of the Association of Public Lighting Engineers were present, previous to their holding a conference in the hall.

At this meeting Mr. S. B. Langlands, J.P. (Lighting Inspector, City of Glasgow, and President-Elect of the Association), presided; and Mr. J. F. Colquhoun, Lighting Engineer, City of Sheffield, President of the Association, spoke about his recent visit to the United States as one of the delegates at the meeting of the International Commission on Illumination.

"American Practice in Illumination; Indoor and Outside Lighting," was the subject of Mr. Colquhoun's remarks. He stated that from his observation of the street lighting of the cities visited, it is evident that there is a considerable difference in the American and the British points of view. The lighting engineers in America give more attention to installations of spectacular lighting, in such highways as State Street, Chicago, and Washington Boulevard, Detroit, than they do in the lighting of less important streets and roads in the residential areas. The cost of the spectacular lighting is usually borne by the merchants, or other interested parties. In these cases, the first consideration in the choice of fittings is appearance, and the high degree of illumination is obtained by expenditure of electrical energy. There is no want of light, but the primary consideration is decoration; and the orders for street lighting equipment are placed with the object of increasing the attractiveness of the street, and so bringing more prospective customers to it.

It would appear that the arrangement is satisfactory to the merchant, as the system is common in American cities. The effect is that street lighting in the United States is considered more from the artistic than the scientific point of view. In consequence, the lighting of the streets other than those specially dealt with at the expense of the merchants is below the standards considered necessary in Great Britain.

After the remarks of Mr. Colquhoun, a discussion took place, in which the following joined: Councillor McKechnie (Chairman of the Lighting Committee, City of Edinburgh); Mr. S. B. Langlands, Glasgow; Messrs. Haydn T. Harrison, London, and C. I. Winstone, London; Capt. W. J. Liberty, London; Messrs. E. J. Stewart, Glasgow; and M. H. Wardle, Liverpool; Col. W. R. Vignoles, D.S.O., London; and Mr. E. H. Horstmann, Bath.

At the conclusion a hearty vote of thanks was accorded to Mr. Colquhoun.

A Council meeting of the Association followed, at which were present the public lighting contractors who had expressed a desire to participate in the proposed exhibition of public lighting appliances at the forthcoming annual meeting and conference at Bournemouth. A draft programme was submitted and approved for the September meeting. It was also stated that the Mayor of Bournemouth would open the exhibition on Monday, Sept. 9. The Council also decided to accept the kind invitation of the Chairman and Directors of the Bournemouth Gas and Water Company to entertain the members and delegates attending the conference at luncheon on Tuesday, Sept. 10.

Leeds Public Libraries and Carbonization.—Mr. R. J. Gordon, the Leeds City Librarian, has published a most valuable list of the resources of the Leeds Public Libraries on the question of low-temperature carbonization literature. The books and data at the disposal of the Leeds ratepayer cover the field remarkably well.

Midland Association of Gas Engineers and Managers.—The annual general meeting of the Association will be held in the Grand Hotel, Birmingham, on Thursday, March 7, at 2.30 p.m., when Mr. C. M. D. Belton, of Shrewsbury, will deliver his Presidential Address. Mr. William Wilson, of Burton-on-Trent, will introduce a discussion on "Are our Manufacturing Methods Progressing?"

Matthew Murray.—An interesting volume on the life and work of Matthew Murray, edited by Mr. E. Kilburn Scott, has been published at 2s. 6d. (paper cover) and 3s. 6d. (cloth bound) by Messrs. Edwin Jowett, Ltd., of Leeds, as part of a memorial to that pioneer engineer. The proceeds from the sales of the book will go towards carrying out other parts of the memorial. The first section of the volume is devoted to a paper by Mr. G. F. Tyas; and also to letters of Matthew Murray himself, M. R. Boulton, and James Watt, Junr., reprinted by permission of the Newcomen Society. The second part contains abstracts from various publications, including notes, chronologies, &c., by the Editor, and contributions by other writers. For quick reference, two chronologies are included, which may be helpful to those who have not time to read the whole book.

BRITISH INDUSTRIES FAIR, BIRMINGHAM.

GAS SECTION—FURTHER NOTES.

Bland Light Syndicate, Ltd.,

25, Grosvenor Place, London, S.W. 1.

This firm are successfully demonstrating to the buyers from overseas and at home that really artistic gas lighting for the home is not only possible, but greatly to be desired. Fittings to harmonize with various period furniture are in evidence, from early Dutch, Louis XV., Georgian, to eccentric modern. Adorning most of these examples are beautifully painted parchment shades. It must be admitted that the general appearance of the "Bland" exhibits are striking; the display including table and floor standards in various woods.

Much has appeared in this "JOURNAL" from time to time advocating the necessity of retaining the "lighting load" in the middle-class home and the cottage, and one realizes, when viewing this stand, that it is possible by offering burners and fittings of types to suit the various tastes of the consumer, to attract him to gas for lighting. Thus it is not only possible to retain, but to extend this load.

The "Bland" No. 1928 Burner.

The "Gould" silent burner is well known, and is a great boon to so many where equal distribution of pressure and make are not always possible.

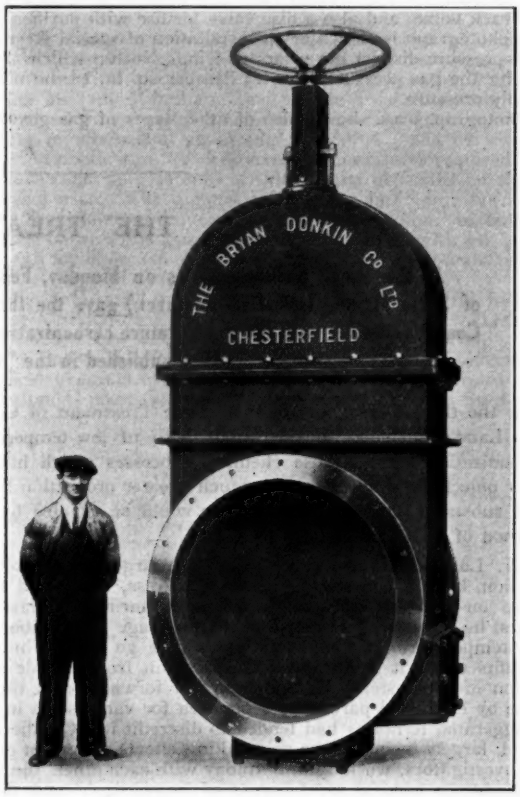
One type of domestic burner on the stand has attracted considerable notice, because of its exceptional "duty," giving an illuminating power, at an angle of 60°, of 205·2 candles, with a consumption of gas amounting to only 5·50 c.ft. per hour (nearly 38 candles per c.ft.). It is fitted with a patent mixer and superheater, with 3 bijou mantles attached. It is known as No. 1928, an illustration of which is given.

The same idea is reproduced with an aluminized swan-neck street lamp burner in various multiples for both bijou and No. 2 mantles. These can be attached to a new "Hurricane" street lamp, which, short of being blown off the lamp column, will withstand a gale of any known velocity. Another feature of the stand is a 17th century clock doing "strange duty." At the end of the pendulum is attached a powerful Bland burner, swinging to and fro; its beams light up an invitation to the visitor to "move with the times and buy Bland burners and mantles."

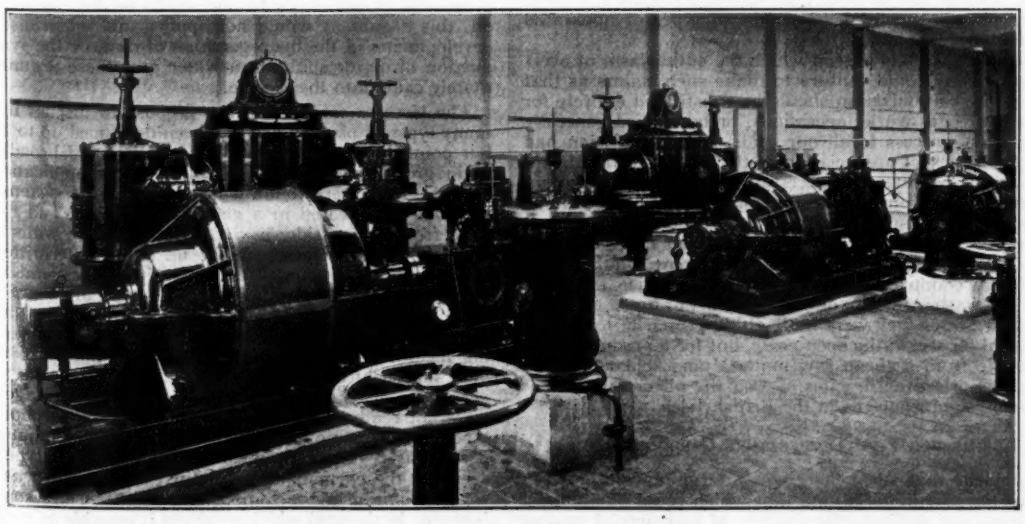
Bryan Donkin Company, Ltd.,

Chesterfield.

Among the numerous photographs shown by this firm are many examples of Rateau turbo exhausting plants. The Company hold the licence from Prof. Rateau for the manufacture of turbo exhausters, compressors, boosters, and blowers, and



Bryan-Donkin Double-Faced Internal Screw Valve, with indicator, supplied to the Birmingham Corporation Gas Department.



THREE-STAGE RATEAU TURBO EXHAUSTERS (COMBINED CAPACITY 15 MILLION C.FT. PER DAY) BY BRYAN-DONKIN, INSTALLED AT THE PARTINGTON WORKS OF THE MANCHESTER GAS DEPARTMENT.

have now supplied over 260 to gas-works, coke oven installations, &c. They have recently fixed at the New Partington Gas-Works, Manchester, three sets of 3-stage Rateau turbo exhausters, driven by steam turbines at a speed of 4300 R.P.M., the combined capacity being 15 million c.ft. per 24 hours. These plants are shown in the photograph reproduced. The Company have also supplied to the same works two sets of Rateau turbo boosters, driven by electric motors, with a combined capacity of a million cubic feet per hour, together with two horizontal steam-driven reciprocating compressors and two rotary air blowers driven by steam engines.

For the last 75 years the Company have been making exhausters which are now used in all parts of the world, in gas-works and for many industrial purposes; the total number being upwards of 7000. Models are exhibited on the stand of the two-blade and three-blade type exhausters.

Another specialty of the Company is gas valves, which they have been making over eighty years. The illustration shows a large double-faced internal screw valve with indicator recently supplied by them to the Birmingham Corporation. Last year the sales reached a total of over ten thousand valves. Models are exhibited of high and medium pressure double-faced valves, the well-known single-faced rack and pinion valve, and worm and rack valve, and also a disc valve for use with purifiers.

A photograph is shown of an installation of special Reynold's high-pressure district governors at Kings Norton which are reducing the gas pressure from 15 lbs. per sq. in. to the normal supply pressure.

Photographs are shown also of other types of gas governors and regulators of which many thousands have been supplied for district and service work.

The Company are among the pioneers of high-pressure system of gas distribution in this country.

Their specialties also include rotary and reciprocating gas compressors, pressure blowers for industrial purposes, and oil spraying plants to prevent naphthalene troubles.

George Wilson Gas Meters, Ltd.,

Coventry.

Supplementing the notice of the exhibits of this firm, appearing in last week's "JOURNAL," further mention may be made to their specially prepared diaphragms. We are informed that these have been subjected to drastic tests with benzole, paraffin, acid, &c., which they have stood in a highly satisfactory way. In view, however, of the guarantees required for meters, Messrs. Wilson do not feel justified, in spite of these favourable results, in placing the diaphragms on the market without further tests in general use; and they invoke the assistance of gas engineers in fixing meters so fitted on their districts for special observation and investigation, so that, when the claims have been substantiated, the introduction of the diaphragms can be speeded up.

Another feature of great interest exhibited by this firm is a meter, Government stamped, passing 300 c.ft. per hour in a 3-light case. Wonderful results have been obtained by this meter; but some doubt exists as to whether it will be placed on the market, owing to the extra cost in construction.

THE TREATMENT OF COAL.

At the Royal Society of Arts on Monday, Feb. 4, Dr. C. H. Lander (Director of Fuel Research, Department of Scientific and Industrial Research) gave the third of a series of three Cantor Lectures on "The Treatment of Coal," and dealt with low-temperature carbonization and hydrogenation. Abstracts of the first and second lectures were published in the "JOURNAL" for Feb. 6 and Feb. 13.

In the third Cantor Lecture on "The Treatment of Coal," Dr. Lander included considerations both of low-temperature carbonization and of those chemical processes which had for their object the conversion of a much greater proportion of the coal substance into liquid fuels than could be effected by any method of carbonization.

Dr. Lander said that, in view of the large amount of discussion, both at conferences and in the Press, which had taken place on low-temperature carbonization during the last two years, he felt it was unnecessary at this stage to describe what low-temperature carbonization was, or to go closely into the benefits which it was claimed would result from a wide application of the system. It had been put forward from time to time by interested parties as a panacea for various ills in such exaggerated terms as had tended to discredit it. On the other hand, largely owing to the painstaking efforts of certain groups of investigators, working in harmony with each other, there had undoubtedly been a great access of knowledge; and though there did not lie behind low-temperature methods the wealth of practical experience and information which backed up the successful commercial operations of high-temperature carbonization, it could at least be said that they were now fairly well understood, and at the present time in various quarters there was taking place a steady development of types of apparatus based on sound principles.

The time was definitely past in which the enthusiasm of oversanguine promoters could venture to make such claims as that low-temperature carbonization should be substituted entirely for high-temperature gas-works operations, or be applied generally as a preliminary process to all our coal. Much confusion had resulted from a lack of appreciation of the bearing of local conditions upon the commercial success or otherwise of low-temperature methods. From time to time plants were reputed to be in commercial operation abroad, and in certain cases, but not so many as were supposed, with a foundation of fact; but here again the question was affected by the different requirements of the different countries. For instance, in America the problem presented was essentially dissimilar from our home problem. In the United States they were not looking primarily for a substitute for coal for use in the open grate, but for a product which could be made from a cheap raw material and sold as a competitor of high-priced anthracites. Also the oil or tar did not have the same significance as in the British Isles.

THE CLAIMS FOR LOW-TEMPERATURE CARBONIZATION.

It was obvious that when there was a large margin between the price of the raw material and that which could be obtained from the resultant product, the chances of commercial success were greatly enhanced. In this country the claims made for low-temperature carbonization, which were quite justifiable, were twofold. First, it could provide a source of domestic fuel for the open grate, and so would tend to make the country much cleaner, since a very large proportion of the smoke nuisance came from these appliances, and secondly the geological formations of this country were not able to provide directly any appreciable quantities of natural liquid fuel, and they therefore were forced to import from overseas a material which during the last twenty years had rendered itself vital to the continuance of the social conditions of the country in their present form. The quantities of oil and light motor spirits which were now used were so great as to render it extremely unlikely that the complete replacement of sea-borne oil by a home bye-product obtained from a carbonization process could ever take place; but it was almost platitudinous to say that anything that could be done in this direction would be of great national advantage.

In the past the question of national defence had often been cited in this connection; very large quantities of liquid fuels of various kinds being essential in times of national emergency. While considerable stress on this side of the question could legitimately be made some years ago, the great growth in the estimated requirements for national defence now rendered it absolutely impossible to satisfy them, except to a small degree, by a mere bye-product. If, on the other hand, a really large proportion of the coal substance could be directly converted into oil, this argument would not apply; and when discussing the developments in the hydrogenation of coal, or the synthetic production of motor spirit from water gas, these arguments legitimately came into the picture.

The lecturer said he did not propose to discuss in detail the many types of plant which had been developed up to the present, but pointed out that they could be separated broadly into two main groups according to the method of application of heat. In one group were found a large number of systems in which the coal was treated in a gas-tight container and the heat applied from the outside, having to traverse the walls of the container. Such processes might be either intermittent or continuous, but in general an intermittent or semi-intermittent system presented advantages in that type of plant. The other group comprised those plants in which the heat was applied internally by the introduction into the coal container of a heating medium, which was usually either some form of producer gas, superheated steam, or a mixture of the two. Each type of process had its own advantages and disadvantages, and they were not really competitive. Possibly the most popular form—when a dense smokeless fuel in lump form for household purposes was required—was the externally heated type. If, however, for the particular purpose in view the fuel was not necessarily required in the lump form, or there was some property inherent in the coal which rendered it possible to produce a proportion of lump fuel in this way, the method of internal heating

made for economy, since the time necessary for carbonization was thereby shortened.

THE FUEL RESEARCH BOARD AND L.-T. CARBONIZATION.

The Fuel Research Board had put the question of low-temperature carbonization in the forefront of their programme some twelve years ago, and had worked steadily on with it ever since. Various methods had been tried, but it was soon decided to pursue the work along the lines of externally heated retorts. The Board were familiar with the results obtained by various experiments up to that time, but with one or two exceptions such results were extremely nebulous, and the whole subject suffered from a certain lack of concentration. Inventors had tried to do too much at once. Having obtained, for instance, a partial success on one type of coal they were anxious to prove that their system was applicable to many other types. In certain cases, having found some disability associated with details in their own design of plant, they had been in too great a hurry to change such details before they really understood the scientific factors governing the disability. Few people had stuck to a well defined path and resisted the temptation to explore the by-paths before they had really found what their main work was leading up to. Serious failures had occurred through the erection of large batteries consisting of a multiplication of units, and this had been done long before the unit itself had been properly tried out. In the early days very large amounts of money had been squandered, and the whole subject offered a striking example of what has been aptly termed "research by catastrophe."

WORK OF THE SCOTTISH SHALE OIL INDUSTRY.

When the Board commenced operations there were several types of externally heated plant which were the subject of careful and conservative development. There were also one or two internally heated types of retort under investigation in very able hands. The Scottish shale oil industry had worked for many years using low-temperature processes, and many data were available from this source. It must not be forgotten that this industry itself was originally started to develop James Young's patents for making lamp oil and paraffin wax from bituminous coal. The early operations of the gas industry incorporated what were really low-temperature methods, since carbonization was carried out in cast-iron retorts which could not withstand temperatures much in excess of 600° to 700° C. The methods adopted, however, in these old industries required radical modification and development before it could be hoped to make a commercial success of the treatment of bituminous coal under modern conditions, an important factor of which was the competition of naturally occurring oil.

The lecturer pointed out that at the present time it had not been definitely proved by anyone that commercial success had been obtained, and indeed that the time had been too short for such definite proofs to be forthcoming. The technical working of a plant was not the only factor which affected the commercial prospects, but they were also affected by local conditions and management.

At present there were several large scale plants running, and more were being erected; and reliable commercial data should be available very shortly, even if not obtained already. The process was very definitely launched, and the different systems would now have to stand or fall according as they could or could not pay dividends from the results achieved in day to day working.

The Fuel Research Board, after working with several types of apparatus, had adopted one which was a modification of that used in the Scottish shale oil industry. The retorts were of cast iron 6 ft. 3 in. by 7 in. at the top tapering to 6 ft. 9 in. by 11 in. at the bottom, and 21 ft. high. A semi-intermittent method of working had been adopted by which it had been found possible to obtain good results over a wide range of coals. A semi-commercial battery of 40 of these retorts was now being heated up at the Richmond Gas-Works, and carbonizing should commence in a few weeks' time. In conjunction with these a setting of Hird retorts was also to be tried.

GOVERNMENT EXPERIMENTAL PLANT.

Dr. Lander said it was not necessary to go into the negotiations which took place between the Government Departments concerned and the Gas Light and Coke Company before the arrangements were concluded for this semi-commercial trial, but emphasized that Sir David Milne-Watson was asked by the Government to select some one type of plant for experiment, the Government undertaking to guarantee the capital cost of the plant under the Trade Facilities Act. Under the agreement the plant would be run "as continually as is reasonably practicable" for a prolonged period in order to obtain accurate information both as to the technical and commercial possibilities of the method.

The lecturer also referred to the scheme whereby the Department of Scientific and Industrial Research was authorized to test at public expense such plants as claimed to have reached the full unit scale. Six tests had been made, and others were in hand. He felt that these tests had clarified the subject, and had helped both the promoters and the public by furnishing independent testimony as to the yields of products and the ease of working, &c., during a test of fairly lengthy duration.

It was pointed out that the yield of tar obtained by low-temperature carbonization was of the order of 16 to 25 gallons per ton of coal. Though higher figures might be obtained under exceptional circumstances, it was not likely that this could be increased by more than (say) 30 to 40 p.ct.

THE HYDROGENATION PROCESS.

The hydrogenation process had been shown by experiments both at the Fuel Research Station and elsewhere to be capable of producing from 110 to 130 gallons of distillable oil per ton of coal actually used in the process, though an additional quantity of coal might be required for power and hydrogen production. The process consisted in adding hydrogen to the coal substance under conditions of elevated temperatures and pressures. In this way a considerable portion of the coal substance was converted to a product which was liquid at ordinary temperatures.

A problem of considerable difficulty was that of introducing a solid material such as coal into a vessel containing hydrogen under a pressure of 200 atmospheres. Bergius had solved this by mixing ground coal with a liquid organic vehicle so as to form a paste which could be pumped by special appliances. To this mixture was added a small proportion of iron oxide to act either as a catalyst or as a means of removing sulphide of hydrogen in the gases evolved. In the continuous type of plant used at Mannheim and at the Fuel Research Station three reaction vessels or bombs were used in series, the first being maintained at about 460° to 480° C., and the two final ones at about 490° C. The exact temperatures required in the final bombs were somewhat critical and depended on the type of coal used. The product leaving the last bomb was cooled and its pressure reduced in two stages, first, to 60 atmospheres where the gas evolved was scrubbed with oil in order to extract motor spirit, and secondly, to atmospheric pressure where the final crude product was collected.

The final crude product contained the whole of the inorganic matter of the coal, together with the added iron oxide and a certain amount of partially converted solid material. These solids had to be removed before distillation could be effected. A typical example of the yields per ton of coal obtained in the continuous plant (one ton per day) at the Research Station was as follows:

Yields per Ton of Coal.

HYDROGEN CONSUMED = 114 Lbs.

Fraction	0°–175°	= 83 lbs.
,,	175°–230°	= 208 ,,
,,	230°–270°	= 197 ,,
,,	270°–310°	= 105 ,,
,,	310°–360°	= 208 ,,
	PITCH	= 329 ,,
Gas benzine		= 42 ,,
Bergin gas		= 325 ,,
Unconverted coal		= 363 ,,
Water		= 179 ,,
Coal ash		= 161 ,,
Loss		= 154 ,,
		2354 lbs.

It would appear that the chief value of the fractions from the hydrogenation of coal would be either as a motor spirit or as fuel oil, though there were indications that certain of the fractions might be of value as lubricating bases.

A large amount of work had also been carried out in small bombs worked intermittently, but considerable difficulty had been experienced in correlating the results of small scale intermittent working with those obtained in the continuously operated pilot plant.

HYDROGEN IN THE CONVERSION OF COAL TO OIL.

The hydrogenation plant at the Fuel Research Station was also used to investigate the exact part played by the hydrogen in converting the coal into oil; and coal had been fractionally hydrogenated, the process being interrupted at a series of stages. It was found in experiments in which an extremely small amount of hydrogen had combined with the coal that the first effect of this was to produce a product which was fluid at the temperature and pressure of the reaction, and which became solid on cooling. This product possessed caking properties much greater than those of the coal from which it was formed, and even when the coal used was non-caking the product possessed very high caking properties. In general, the work showed that in the first instance the hydrogen appeared to eliminate oxygen from the coal substance. The phenomenon was being investigated from a number of angles, but it was not yet possible to explain fully the exact mechanics of the reactions. Though probably of great importance in the future, the process of hydrogenation, at any rate so far as the bituminous coals of this country were concerned, was not able to make oil as yet at a price anywhere near that of the cost of similar fuels obtained from natural sources.

A hearty vote of thanks was accorded Dr. Lander for his lecture, on the motion of Col. THE MASTER OF SEMPILL (President of the Royal Aeronautical Society).

THOMAS RECORDING GAS CALORIMETER.

In the Thomas recording gas calorimeter, which has been officially approved by the Gas Referees, the calorific value of the gas is determined by transferring all the heat obtained from the combustion of the gas under test to a stream of heat-absorbing air, and measuring the consequent rise in the temperature of this air. The streams of gas, heat-absorbing air, and air required to support combustion are maintained in a fixed volumetric ratio by three separate wet meters geared together, motor driven, and working in a common water seal. The gas is burned in a closed burner, round which flows the heat-absorbing air. The temperature rise of the heat-absorbing air is therefore directly proportional to the calorific value of the gas, without regard to the actual rate of burning. The gas, heat-absorbing air, and the air required to support combustion are saturated before they are metered, and provision is made to ensure that the gas and air are metered at the same pressure and temperature. The results are therefore automatically given at 30 in. and 60° Fahr. saturated, without the introduction of any additional devices. The products of combustion are kept separate from the stream of heat-absorbing air, and escape to the atmosphere at practically atmospheric temperature, so that the true total, or gross, calorific value is recorded without the necessity of applying any corrections.

The Thomas calorimeter consists of two parts—the tank or calorimeter proper, in which the calorific value of the gas is determined, and the recording instrument, which translates the heat measurements into thermal units, and continuously records the calorific value on a chart. The two parts of the calorimeter are electrically connected, and may be any distance apart.

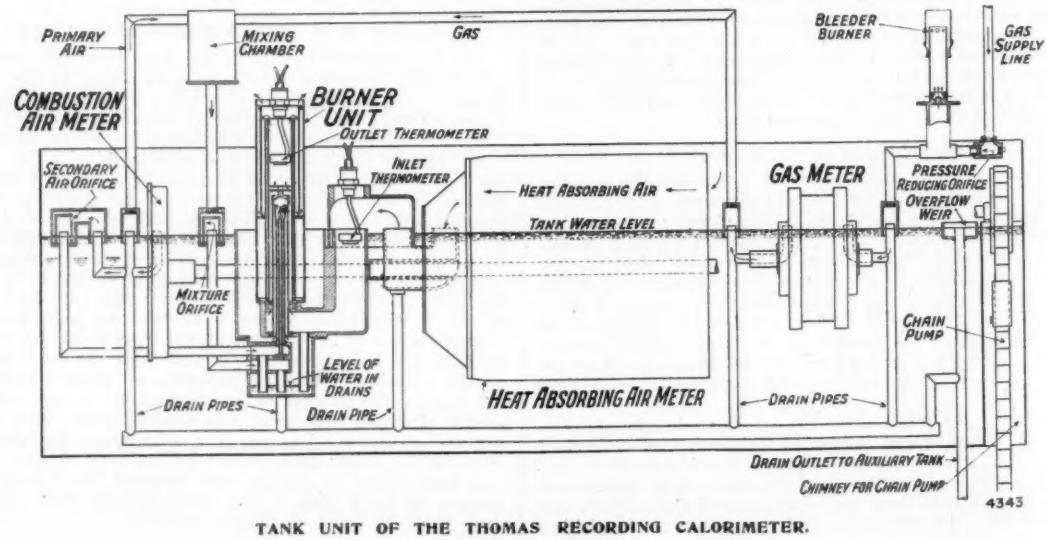
The tank unit is shown in section in the accompanying diagram; the direction of flow of the gas under test being indicated by arrows. Before the test gas reaches the meter, it passes through a small orifice to a chamber open to the atmosphere by means of an open bleeder burner, which prevents any pressure building up in the chamber. From this same chamber is connected the intake pipe to the gas meter. The orifice and chamber perform two functions: Sufficient gas is drawn from the pipeline to provide a fresh sample for the calorimeter, and a supply of the test gas at atmospheric pressure is delivered to the meter. Approximately 0·25 c.ft. of gas per hour is burned by the calorimeter proper, while about 3 c.ft. per hour is used at the open burner. After leaving the meter, the gas enters a mixing chamber, where it meets a stream of air from the combustion air meter. The mixture of gas and air then flows through a small orifice to the burner, where combustion takes place. The purpose of the orifice is to adjust the proportions of the mixture and to cause a slight pressure in the mixing chamber, which counteracts any irregularities in the rate of flow of gas and air from the meters. An orifice in the secondary air-pipe helps to produce the same results. To ensure complete combustion, a small amount of secondary air is supplied direct to the flame at the moment of combustion. The products of combustion then pass out of the bottom of the burner after having transferred their heat to a stream of heat-absorbing air, the direction of flow of which through the burner is counter to that of the combustion gases. The products of combustion are thus cooled to within 2° or 3° Fahr. of the temperature of the entering cold air.

The gas meter, the combustion air meter, and the meter for the heat-absorbing air are accurately machined castings, and operate in a similar manner to an ordinary water-sealed gas meter. The internal vanes are designed to cause little disturbance of the water level; the inlet and outlet ports reduce as much as possible the water-line area of the metering chambers at the moment of sealing off, thereby ensuring constant deliveries. The supply of air for the air meters is taken from the air in the tank above the common water seal. The three meters are maintained in fixed alignment by being mounted together on a metal base. The meter drums are driven by an electric motor through suitable gearing. The accuracy of the results is unaffected by changes in the speed of the metering drums, providing that such variations do not exceed 10 p.ct. of the normal figure. The meters are adjusted and calibrated to give a standard discharge, but may be geared in other ratios to suit gases of different calorific values. The water in the tank is maintained at a constant level by means of an overflow weir, a bucket chain pump constantly bringing up water from an auxiliary supply tank. The incoming water splashes over the weir, thus keeping its surface wet and maintaining a true head. The fact that the same volume of water is used practically continuously (the only loss being due to evaporation from the tank) eliminates troubles due to flocculent material, and reduces installation and running costs. When ordinary tap water is used for filling the tank, it is customary to dissolve 0·01 p.ct. of potassium dichromate in the water, in order to prevent electrolytic effects and the growth of organic material.

The sample of gas is burned in a closed type burner which is entirely separate from the heat-absorbing air. To guard against errors due to rapid changes in the temperature of the room in which the tank is mounted, and the effect of accidental draughts, and also to stabilize cold balance settings, the burner casting carrying the burner is immersed below the surface of the water in the tank to within about 0·2 in. from its top. All the tubes which are exposed to the flame or to the hot gaseous products are made of quartz, in order to avoid corrosion effects. The burner therefore has a long life. The combustible mixture of gas and air enters the burner saturated and at the temperature of the tank, and leaves the calorimeter within about 2° of the same temperature. To cut-down heat losses, a polished double-walled tube is provided round the burner jacket, which is in turn jacketed with the heated air.

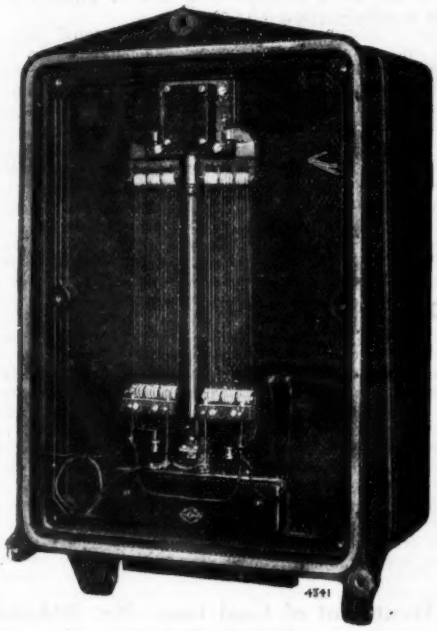
The inlet and outlet thermometers are of the electrical resistance type. They are made of selected nickel wire and have an approximate resistance of 50 ohms; they are calibrated to have standard constants, the resistances being so adjusted as to compensate for any variations in the specific heat and saturation temperature of the gas and air. The thermometers are used differentially, and are connected by ordinary connecting leads to the recording instrument. They are arranged to form two arms of a Wheatstone bridge; the other two arms being fixed resistances, made of manganin, which are incorporated in the recorder unit. The current for the bridge circuit is obtained from a generator driven by the motor which operates the meters in the tank unit.

The patented recorder unit contains the two fixed arms for the Wheatstone bridge, means for automatically balancing the bridge, and mechanism for graphically recording the calorific value of the gas. The galvanometer is of the moving coil type with double suspension. The chart, which runs for one month at a speed of ½ in. per hour, is 6·8 in. wide, divided into 68 divisions equally spaced 0·1 in. apart. The centre line corresponds to the declared calorific value of the gas being measured, while



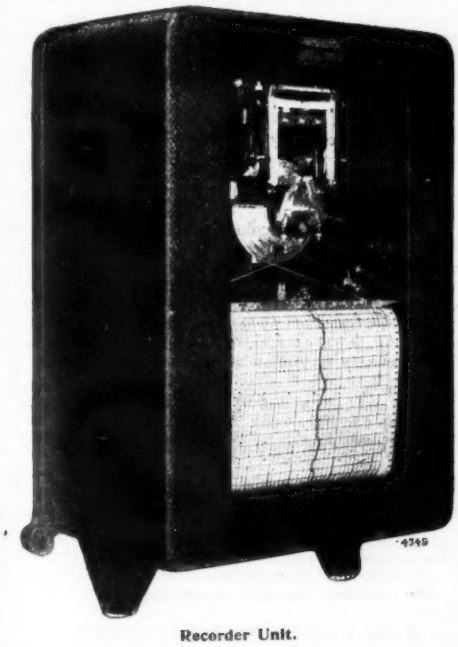
TANK UNIT OF THE THOMAS RECORDING CALORIMETER.

each division represents 0·5 p.ct. of this value. An engraved scale is fitted above the recording pen, so that the actual calorific value at any moment can be observed. The power required to operate the recording mechanism and to wind the recorder chart is obtained from a hot wire motor mounted in a separate compartment in the recorder case. This motor, which depends on the contraction and expansion of wires when heated by an electric current, is reliable in action, and gives a smooth, even, reciprocating motion to the mechanism.



Hot Wire Element.

The recorder may be operated from any convenient electric supply, either direct or alternating current, the voltage of which lies between 100 and 250. The recorder can be fitted with a device whereby alarm signals such as coloured lights, electric bells, or a klaxon horn may be operated if the calorific value of the gas should vary from the declared value by more than a predetermined percentage. These alarm signals may be installed in the retort house or other suitable position, some distance away from the calorimeter. Alternatively, three coloured lights can be arranged to indicate automatically the



Recorder Unit.

direction and amount of any deviation of the calorific value from the required figure.

The current for the Wheatstone bridge circuit is supplied by a generator driven by a motor, which also drives the three meter drums through suitable reduction gearing. The total current consumed by this motor and the hot wire motor in the recorder amounts to approximately 5 units per day. Other maintenance requirements are confined to changing the recorder charts once a month, periodically refilling the pen with ink, and occasionally oiling the moving parts.

Frequently the official recorder is installed in some central building, and it is desired to have a record of the calorific value available in the gas-works itself. A second recording mechanism can then be installed in the gas-works, and controlled from the official recorder, so that a duplicate record is traced.

The advantages of this instrument may be summed up as follows:

It automatically gives an accurate continuous record of the calorific value of the gas, which is unaffected by variations in pressure, temperature, or humidity.

On gases of steady calorific value normally met with in gas-works practice, the calorimeter will record the calorific value to within ± 1 B.Th.U.

When once standardized, the calorimeter will maintain its calibration accurately over long periods of time.

The results are unaffected by changes in the speed of rotation of the meter drums, providing such changes do not exceed 10 p.ct. of the normal speed.

The record is traced on an open chart; one roll of paper lasting a month.

A duplicate recorder and signal lamps, or alarms, can be operated by one calorimeter.

The use of quartz for the burner tubes which are exposed to the flame or hot gaseous products indefinitely prolongs the life of the burner and eliminates the need of cleaning the unit from time to time.

Practically the same volume of water is used continuously; the only loss being due to evaporation from the tank. This eliminates troubles due to flocculent material, and also reduces installation and running costs.

Apart from the cost of the electric current required to operate the motor generator and the recorder motor (approximately 5 units per day), maintenance requirements are confined to changing the recorder chart three times a year, periodically refilling the recorder pen with ink, and occasionally oiling the moving parts.

The apparatus is compact. The tank unit is 2 ft. 3 in. by 3 ft. 9 in. by 3 ft. 9 in. in height, while the recorder may be mounted on a wall or other vertical support. The two units may be any distance apart.

Over 500 Thomas recording calorimeters are giving satisfactory service in gas-works and coke oven plants.

PARLIAMENTARY INTELLIGENCE.

[From Our Special Correspondents.]

HOUSE OF LORDS.

Gas Undertakings Bill.

The Government's Gas Undertakings Bill was introduced on Tuesday, Feb. 19, by the Earl of Lucan, and given a First Reading. There was no discussion at this stage. It was put down for Second Reading last night.

Private Bills.

The following petitions have been presented against Private Bills in the House of Lords. Against the Aldershot Gas, Water, and District Lighting Bill by the Godalming Gas and Coke Company, Ltd.; against the Romford Gas Bill by the Essex County Council; against the Wandsworth, Wimbledon, and Epsom District Gas Bill by the District Councils of Epsom Urban and Epsom Rural, Mitcham, Merton and Morden, the London County Council, and the Southern Railway Company.

Gas undertakings themselves are petitioning against the following Bills: The East Hull Gas Company and the Hessle Gas Company against the Kingston-upon-Hull Extension Bill; the Gas Light and Coke Company and the Wandsworth, Wimbledon, and Epsom District Gas Company against the London Building Acts Consolidation Bill; while the Gas and Water Annuitants are opposing the Birmingham Corporation General Powers Bill.

HOUSE OF COMMONS.

Gas Explosions.

Mr. HORE-BELISHA asked the Home Secretary whether he had received the Report of the Commission inquiring into the circumstances of the series of explosions and fires which occurred on Dec. 20 and 21; and, if so, what action it was proposed to take to prevent the recurrence of explosions of this kind.

Sir W. JOYNSON-HICKS said that the answer to the first part of the question was in the negative, and that the second part did not therefore at present arise.

Committees on Gas Bills.

The following Committee has been appointed to consider the South Suburban Gas Bill, the Gas Light and Coke Company's Bill, and the Winchester Water and Gas Bill: Sir John Ganzoni (Chairman), Sir Sydney Henn, Mr. Longbottom, and Col. Stott. The South Suburban Bill was taken yesterday, and the Gas Light and Coke Company's Bill is down for to-morrow.

The Sheffield Gas (Consolidation) Bill has been referred to the Joint

Committee of Lords and Commons dealing with all Private Consolidation Bills.

Smokeless Fuel.

Sir ROBERT THOMAS asked the Secretary for Mines on Feb. 19 if he could state the figures for the output of smokeless fuel in England and Wales for any convenient recent week, and, in view of the importance of popularizing the use of smokeless fuel as a substitute for raw coal in domestic grates, whether he would undertake, through the Empire Marketing Board, an advertising campaign on behalf of that fuel.

Commodore KING replied that he presumed the question referred to the residual fuel of low-temperature carbonization processes. If so, he was not in possession of the figures asked for, and did not think that the size of the industry yet justified him in calling for them. The advertising campaign suggested was neither necessary nor advisable, as he understood that the Companies producing such fuel had had no difficulty in disposing of it. He said he was advised that, in any case, such a campaign would be outside the scope of the Empire Marketing Board.

Mr. MARDY JONES asked if it was not a fact that the best smokeless fuel in the world was Welsh anthracite.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

Clearing Stopped Lamp Services in Frost.

SIR,—It has occurred to me that it may be of benefit to other engineers whose street lighting, like that in Bradford, has been affected by the frost, to know of a method which I have found successful in clearing lamp services.

If about a tablespoonful of a mixture of equal parts of crude glycerine and water (warm if possible) is poured down the stopped lamp service, it dissolves the hoar frost obstructing the service, and appears to prevent a recurrence of the trouble for some days at least.

This mixture I find both more effective and more lasting than methylated spirit; and it is obviously less costly.

ERNEST J. SUTCLIFFE,
Gas Engineer and Manager.

Town Hall, Bradford,
Feb. 19, 1929.

REGISTER OF PATENTS.

Treatment of Coal Gas.—No. 304,333.

COOPER, C., HENSHAW, D. M., and HOLMES & CO., LTD., all of Huddersfield.

No. 18,844; July 15, 1927.

The process of treating crude and hot fuel gas in accordance with this invention comprises essentially the removal of the greater proportion of the water by bringing the gas into intimate and direct contact with solutions of salts of such concentration or composition that their vapour pressure at any given temperature is materially below the vapour pressure of water, and in such conditions that they take up water from the gas without correspondingly taking up free ammonia, and may act as a cooling medium leaving the gas in an unsaturated condition.

The solutions employed will generally be as concentrated as possible and of relatively high specific gravity—that is to say, of such specific gravity as to ensure that the constituents insoluble in water which are condensed will float on the surface of the solution. Solutions of salts which will not react with constituents of the gas with the production of insoluble compounds are preferably used; moreover, it is desirable, if not essential, that the solutions should be such that they do not form emulsions with tar or other non-aqueous materials which are condensed from the gas.

Conveniently for the purpose of the invention, a solution of ammonium salts, or both ammonium salts and other salts, is employed; and this may consist wholly or partly of a suitably concentrated solution of the "fixed ammonium salts" which have been separated out from fuel gases on cooling and optionally washing the gases. Solutions of sulphate of ammonia prepared in any suitable manner may, however, be used; alternatively, salts of metals alone or in association with ammonium salts.

The solutions will normally be of the highest concentration possible or convenient having regard to the temperature at which they are employed. A solution of ammonium chloride of 70° C. will contain 37·5 p.ct. of the salt, while a corresponding solution of ammonium sulphate will containing 48 p.ct. of the salt. The vapour pressures of the two saturated solutions above-mentioned expressed in fractions of the vapour pressure of water are respectively 0·7 and 0·75; and their capacity to take up water from a gas containing the same will be very high. Usually the solutions employed will be such as have a vapour pressure of not less than half that of water.

In accordance with the invention the gases are brought during the course of the cooling treatment (or during a proportion thereof) preferably simultaneously or successively into contact with the salt solution and with tar or constituents of tar in a liquid state which will facilitate the removal from the gases of bodies other than water which at the normal atmospheric temperature are liquids. Vertical tower washers provided with mechanical distributing means may be employed.

The expulsion of the water from the water-absorbing material may be secured by the sensible and latent heat contained in the gases. Thus, for example, the salt solution after it has become diluted by taking up moisture from the gases will have its vapour pressure and also its temperature raised; and by exposing it to the atmosphere an evaporative effect will be secured. The latter may be increased by bringing the material into direct or indirect contact with the hot fuel gases, or heat may be applied to the material in any other convenient manner in order to promote evaporation.

The treatment to effect the removal of water from, and to cool, the gases is carried out in a plurality of stages which may more or less merge one into the other; and the composition or character of the water-absorbing material used in these stages may be varied. For example, the treatment may be carried out in three stages. In the first stage the gas will be treated at or about its normal dew-point with a concentrated solution of, for instance, ammonium salts having a vapour pressure less than water, the cooling effect being secured by passing the salt solution used as water-absorbing material through the tubes exposed to the air and over which the spent salt solution is made to run. In the second stage the operation may be carried out in a similar manner, but the water-absorbing material entering may differ in composition and have been previously cooled; the temperature conditions, however, being such as to ensure the desired evaporative effect when the diluted solution is exposed to the air. In the third stage the gases are cooled by means of another solution which has itself been cooled to a suitable degree; and this solution may, for example, be the cold mother liquor obtained by the crystallization of the completely evaporated solution leaving a previous stage. Direct water cooling may be used in this stage.

Further features are dealt with in the specification; and a diagram of suitable apparatus is given.

Treatment of Coal Gas.—No. 304,345.

IMPERIAL CHEMICAL INDUSTRIES, LTD., of Westminster, S.W. 1, GORDON, K., and HUGHES, J., both of Norton-on-Tees.

No. 27,513; Oct. 17, 1927.

The patentees claim to have found a specially advantageous method of treating coal distillation gases which does not require low temperature cooling and which permits of what is for practical purposes a complete separation of the commercially valuable constituents of the gas in three principal steps.

According to the invention, in a process for treating coke and like gases (which have already been subjected to purification resulting in the removal of tar, ammonia, benzole, and optionally sulphur compounds) the steps consist in scrubbing the gas under pressure with different washing liquids in three successive stages to remove first carbon dioxide together with sulphur compounds if not previously removed, secondly carbon monoxide and unsaturated hydrocarbons, and thirdly methane and the like, in such a manner that each removable constituent is substantially eliminated in the one appropriate step. The residual gases consist of nitrogen and hydrogen, and can be employed for ammonia synthesis. Tar, ammonia, benzole, and optionally sulphur should be removed in the usual manner; but this forms no part of the invention. The invention includes, however, the features of regenerating the absorbed gases from the respective washing solutions and employing them in the production of valuable compounds.

The gas issuing from the coke ovens is washed with water and scrubbed with oil in the usual manner to remove tar, ammonia, and benzole; and the clean gas is then compressed to above 100 atmospheres and preferably 250 atmospheres. If desired, the debenzolization can be effected under pressure. Carbon dioxide, hydrogen sulphide, &c., are now removed by washing the gas with ammonia liquor (preferably strong, *e.g.*, 25 p.ct. by weight), and a gas is produced having approximately the following composition:

Hydrogen	55 p.ct. by volume
Methane and homologues	30 ,, ,, ,,
Unsaturated hydrocarbons	2 ,, ,, ,,
Carbon monoxide	5 ,, ,, ,,
Nitrogen	8 ,, ,, ,,

This gas is treated under the same pressure in a tower with a washing solution of ammoniacal cuprous salt, such as formate, acetate, or carbonate. This single washing solution removes from the gas practically the whole of the carbon monoxide and unsaturated hydrocarbons (principally ethylene); and the residual gas now comprises only hydrogen, nitrogen, and methane and its homologues, so that a further washing operation is not required to remove ethylene and acetylene.

This gas is now washed under the same pressure with a suitable high-boiling solution—*e.g.*, with paraffin (preferably kerosene) to remove substantially the whole of the methane. The washed gas consists practically entirely of hydrogen and nitrogen, with a small amount—up to 1 p.ct.—of methane. The ratio of hydrogen to nitrogen in the mixture is adjusted to 3 : 1 by addition of suitable gases; and the mixture is employed for the synthesis of ammonia.

The manner of dealing with the gases absorbed in the respective washing solutions is fully dealt with in the specification.

MISCELLANEOUS NEWS.

HORNSEY GAS COMPANY.

Lowest Selling Price in the Metropolitan Area.

The Annual Ordinary General Meeting of the Proprietors of the Hornsey Gas Company was held at 5, Great Winchester Street, E.C., on Friday, Feb. 22—Mr. A. M. PADDON, M.Inst.C.E. (Chairman of the Company), presiding.

The notice convening the meeting was read by the SECRETARY (Mr. K. Leslie Mortimor, A.C.A.), and the corporate seal of the Company was affixed to the list of proprietors.

The CHAIRMAN said he felt sure that the shareholders would realize, as did the Directors, that the Company had sustained a very great loss as the result of the retirement of Mr. John Marshall Miles from the Board. He had been a Director of the Company for a very long time, and had brought to his office a complete knowledge of gas administration, as well as some personal gifts which were in themselves important qualifications for his duties. He was a man of clear judgment and assiduous industry, and had had that view of his duties as a Director which involved the recognition that he was a trustee of the proprietors' interests. No man had that more clearly before him on all occasions, and his was a most appropriate and effective appointment from the proprietors' point of view. ["Hear, hear."]

Dealing with the Directors' report and statement of accounts for the year 1928, the Chairman said that during the period under review there had been no sensational extension and development of the Company's business. That had been reserved for the past two months, but this period was not under consideration at this meeting. Few companies in the Metropolitan area could have shown a larger increase in 1928 than had the Hornsey Company, and, of course, though sensational increases must be dealt with as they arose, they were not to be anticipated eagerly as a feature of gas administration, for they were very expensive to meet, and they left an aftermath of dissatisfaction in the minds of the consumers which was detrimental to the further development of the undertaking. This was due largely to the anachronistic methods by which gas undertakings collected their revenue from the public.

Though the increase in the Company's business in 1928 was very small, it must not be supposed that the business of the Company had preserved its character. It was changing constantly, in common with that of all other gas undertakings. The "datum line" of service to the public was always falling. Many years ago the gas undertakings had occupied a position in regard to the supply of a public commodity which the electrical undertakings occupied to-day. In those early days the gas undertakings had supplied the well-to-do. Then they had come down to those of lesser financial standing, and to-day the gas business gravitated down to those of small means. The basis of the business was broadening, but its nature was changing; and this was wholly in favour of its stability and its expectation of further developments. Whereas the gas undertakers had in the past supplied something of a luxury, they were now concerned mainly with the provision of a necessity to the people at large.

HIGHER DIVIDEND.

The next item to which he made reference was a gratifying one—namely, that the Directors were able to recommend an augmentation of dividend. Whereas in the year 1927 the rates of distribution were at 6½ p.ct. and 5 p.ct. respectively, the Directors would now ask the proprietors to approve a distribution of 7¼ p.ct. and 5⅝ p.ct. respectively. This represented an increase of ¾ p.ct. in dividend; and he was perfectly certain that this would be acceptable to them. The accounts fully supported that recommendation, notwithstanding the fact that the price at which gas was being sold by the Company was as low as, or lower than, any selling price in the Metropolitan area. Further, the Company's economies in working had been cut down to a lower point than, he believed, the accounts of any other Company could disclose.

Having dealt with the matter first from the proprietors' point of view—for beneficence, as well as charity, began at home—he went on to consider it from the point of view of the consumers. As from Jan. 1, 1928, there was a reduction of 1d. per therm, and a further reduction of ½d. per therm was made as from July 1, 1928. Incidentally, he added that one of the undesirable features of dealing in therms was that reductions in price, expressed in therms, did not appear to be so big as when expressed in thousands of c.ft. The Company had reduced the price of gas to the consumer to the extent of something like £26,000 in the year, which represented a reduction of about 7d. or 8d. per 1000 c.ft. Thus, the consumers had not been forgotten in the general re-distribution of figures as recorded in the report.

ISSUE OF CAPITAL.

In order to meet the demands made upon the Company it had been necessary to issue further capital. Referring to the capital account, he pointed out that the Company had powers to issue further capital in capital stock of over £71,000, and in loan capital of over £105,000. An abnormal figure in the capital account, so far as this Company was concerned, was the very heavy expenditure of capital, amounting to over £43,500, of which by far the paramount proportion—over £40,000—was in respect of new buildings and plant; that amount had been expended almost entirely upon the provision of a new gas-holder and tank. New plant of this description had not been installed since he had become a Director of the Company, nearly 30 years ago.

Mr. J. W. BUCKLEY (Engineer and General Manager) said that 30 years had elapsed since a new holder was installed.

The CHAIRMAN said it would be obvious, therefore, to anyone connected with gas supply that sooner or later further provision must be made, and the proprietors could be assured that their astute and economical Engineer would not spend a penny before he was obliged to. The time had arrived, if indeed it had not already passed, when the works could not be carried on effectively and economically with the storage facilities at present available. During the last two or three weeks, when the demand had increased enormously owing to the extremly cold weather, even the skill of Mr. Buckley had been taxed to keep up with the demand, but it was pleasing to be able to say that on no occasion had it been necessary to reduce the pressure at which the gas was supplied, and that every demand had been met, though the storage, judged by an ordinary engineer's formula, had fallen to something below 5 hours.

The CHAIRMAN said that therefore the provision of the new holder and tank was an absolute necessity. It accounted for the expenditure of £40,000, which was slightly diminished by depreciation, as was the Company's wont.

The account also showed that the Company had over-expended their capital by practically £5000, so that shortly the Directors would have to ask the proprietors, at an extraordinary meeting, to sanction the issue of all the remaining unissued capital as it might be required. He believed that they had sufficient confidence in the Directors to know that not a penny of it would be spent except as might be required by the Company, or even until after it was required.

COST OF DISTRIBUTION.

There were a few outstanding features on the debit side of the revenue account. Coal and oil had cost practically £8000 less than in the previous year, and the cost of maintenance and repairs of works was £3000 less. That latter fact he would state with some apprehension were he not aware that the works were in most excellent order. If he were asked to name a works which constituted a typical instance of how a gas-works should stand in relation to the gas supply of the Metropolis, he would name the Hornsey Works. He was not ashamed of the Hornsey Works in any detail, and the shareholders could feel perfectly confident that the £19,000 odd for works maintenance and repairs, low though it might be when considered as a charge per 1000 c.ft., amply covered everything necessary to produce results such as he had the pleasure of reporting. The expenditure on mains was increased by £2500, and there was a similar increase in respect of meters; that was consistent with the line of development in gas matters to-day. Gas undertakers must pay much more attention to their distributing systems. The cost in that respect was very much more than it was before the war, but the demand to-day was even more urgent and imperative than it was then, because they were moving so quickly. Meters in themselves were giving fresh cause for concern. They did not behave, under present demands, as they did 30 or 40 years ago. They needed constant supervision and, if not replacement, very careful repair and adjustment, and the Company must be prepared for higher costs in that respect. One of the great features of this account was the extraordinarily low price brought to book for the repair and maintenance of stoves and fittings. In many gas undertakings, in order to maintain the stock of stoves and fittings at a representative value, a very large apportionment had to be made in this regard. The Company had written off their stoves in the past at a far greater rate than was customary, so that they had no longer this burden on their shoulders, and were able to meet the cost, so far as the criticisms of auditors and others might allow them to do so, largely as it occurred. That was not only helpful to the undertaking, but was, in the long run, entirely to the advantage of the consumers, as indicated by what the Company were called upon to charge them to-day.

The only other item on the debit side of the account which was abnormal, because it had not occurred twelve months ago, was an appropriation to the special purposes fund account of £3826. It was something in the Company's favour that they should be able to make an appropriation of this amount, having regard to the selling price of gas and the otherwise generally healthy features of the account.

EFFECT OF LOW PRICE OF GAS

With regard to the credit side of the revenue account, the Company had received in respect of gas meters, stoves, and fittings nearly £21,000 less than the amount received a year previously, and that was a necessary corollary of the fact that they were charging to-day 7½d., as against a higher charge a year ago. The amount received in respect of residual products was very remarkable. It represented a reduction of only £2400—from just over £38,000 to £36,000. The Directors had anticipated—intelligently, he considered—a very important reduction in the amount received for residuals; and the fact that the shrinkage was so comparatively trifling was a tribute to the Company's management and the manipulation of the residuals. He could quite understand there being a small reduction if the return in respect of residuals were very small previously; but if one compared the figure of £36,000 with the figure of £79,000 as represent-

ing the cost of coal, oil, and coke, one would appreciate that the ratio was a healthy one.

The outcome of an examination of the revenue account was that there was a reduction of £23,469 in receipts, the expenditure was £1148 less, and the profit £22,321 less. Therefore, the Company had been working on a reduced orbit of finance, and yet had emerged with substantially satisfactory profits.

With regard to the profit and loss account, in spite of the provision for an increased dividend there had been brought into that account £33,813, and there had been taken out of it an augmented amount, after doing all to which he had drawn attention. This carry-forward was more than the Company were entitled strictly to provide for; but the Directors were not prophets and were not speculators, and immediately it had appeared to them that this carry-forward would exceed the amount allowed by the Company's statutory powers, they had taken the measure of reducing the price of gas to the very low figure of 7¼d. per therm. This reduction, however, was not operative during the whole of the period under review. It began to be operative only towards the end of the period; and the full effect of the reduction had not yet disclosed itself. It behoved them to watch the business of the Company closely, to see whether it would fulfil what was anticipated, and, if it did not, to make the necessary adjustments.

With regard to the reserve fund, this was too small, but it was as big as the Company had been able to make it in recent years. One good feature with regard to it was that it was all invested in gilt-edged securities. Company practice varied in this regard. Some held that these funds, though they were not provided for the ordinary business purposes of the undertaking, might be invested in the business itself. This was a policy which had obtained with the Directors of the Company some 30 or 40 years ago, but he considered that it was wrong. He was aware that much larger undertakings than this still continued to merge these ear-marked funds for certain purposes in their general finances. All he could say about this was that they were big enough to know better. He felt sure that his colleagues were with him entirely in regard to the treatment of these independent funds, and that the policy he had indicated would be continued. Similarly, the special purposes fund was invested outside the Company. This constituted a genuine reserve which could be found at a moment's notice. If all these funds were used in the general business of the undertaking, and then the capital account was overspent and it was necessary to obtain a loan from the bankers, the actuality of these reserves was not so obvious to him.

With regard to the benefit fund account, this, from a *prima facie* aspect, had a very healthy appearance. There had been required for disbursements from this account only £972. The Directors had made an appropriation, as they were able to do under present statutory powers, of nearly double that amount, and there was also an accumulation of £2663 as a reserve to draw upon. This fund was based upon an Act of Parliament passed during the early part of the war, and the provisions sanctioned by Parliament had been ample up to the present time. Doubtless they were consistent with the position at the time they were conferred; but it must be obvious to all that, if they were right then, they could not be right now, and this question of the benefit fund account must be in the ordinary order of things reviewed from an actuarial point of view. Doubtless when this was done it would be found that some change, some qualification, and some augmentation of the powers granted so long ago by Parliament might be necessary. Should this be so, the necessary steps would be taken to augment those powers and to place the Company in a position of "theoretical security;" it was certainly in practical security at this particular moment.

Referring to the balance-sheet, which he regarded as an extremely straightforward one, he drew attention to the co-partnership fund, which amounted nominally to £10,442, and was entirely invested in the undertaking, as it should be. "Co-partnership" was a very good name for this movement. Sometimes it was described as "profit-sharing," which term he objected to strongly, because it might mean anything as to both the nature of the sharing and the quantity of the shares. In co-partnership, as the name implied, there was involved co-operation, and there was also involved domestic interdependence as between the workers and the administration of the Company, who were working together for the common benefit. It demonstrated its value as an industrial feature year by year; and it had done so in 1928, as usual. In order to appreciate the practical value of co-partnership, one should not look entirely at one's own experience, but rather to the demands that existed outside the co-partnership undertakings, in industry generally, for some such thing to relieve the tension and the distress which were almost universal. One had only to look at the great coal industry, or the cotton industry; in fact, if one selected at random any particular instance of predominant industrial activity, one would appreciate that its condition constituted a demand for something which did what co-partnership had been shown to do for the Hornsey Gas Company and others. The evils existing for the want of the adoption of co-partnership would be appreciated by anybody who gave the matter a little patient study. It had been worth all the trouble the Hornsey Company had expended upon it. The trouble had not all been on the one side, however; the co-partners had to take some trouble to co-operate, or one could not call it co-partnership. The administration had had to take much of the responsibility at its inception, and the executive officers had had to shoulder an additional burden in promoting and carrying it on, but it had more than fulfilled expectations, and so far as he could see the future held an unreaped harvest of success in store for the Company.

Discussing the general prospects of the gas industry, he said one heard on all sides and one gathered from the Press—particularly the newspapers with large circulations—the inference that the industry was going down hill, that it was an anachronism, and that it was being swept aside by its more powerful competitor, the electrical industry. No doubt it ought to be if all the King's horses and all the King's men were engaged in pushing a big industry, as they seemed to be doing, in detriment to all fair play. But the position of the gas industry was nothing like that. The accounts of the Hornsey Gas Company resembled those of other gas companies in their general feature, and the gas industry was going forward. The nature of the business was changing, however; the public it supplied was changing; and the industry's methods must change, and change rapidly, if it were to do all that was required to achieve the commercial success which was practicable and possible. It must develop. In many ways it had changed. The demand for gas for heating was ever increasing, and the question of gas heating was of ever-growing importance. Quite recently there had been an almost incredible transformation in the nature of the supply of heat by gas fires. The new radiants—and his words in this connection were measured—were startling those responsible authorities who had a public use for them. A little time ago he had suggested that in a certain big hospital for women and children the new radiant method of heating should be given a trial. The radiants were made of a new refractory material. He had known that it would appeal by reason of its improved appearance as compared with the old radiant material, but he had been surprised to hear recently from a great surgical authority that it had merits which were utterly unsuspected before. It was pointed out by the nurses and doctors at the hospital in question that not only was the concentrated scorching effect of the ordinary gas fire avoided, but that the heat was effective and congenial at a far greater distance than was the case when the old type of fire was used, and that it had a distinctly hygienic effect upon children. Readers of "The Times" would know that that effect was discovered some months ago at the Zoo, and he firmly believed that this development would conduce to a very much extended use of gas for heating.

Another form of development was that the gas companies provided, by their new systems in regard to coke, a means of meeting the rapidly developing demand for the provision of hot water in small houses. That again had been gratifying, and coke, instead of being refuse, would become a genuine residual.

Those were only two instances of the progress that was being made, and in every direction the gas industry was showing extraordinary fertility in its development to meet the public demands. One need have no doubt about the future of the gas industry if it were intelligently and energetically administered, as it had been, and as it would be, and he did not think the proprietors of the Hornsey Gas Company would say that the Directors had been negligent or that they had been bad stewards of the proprietors' interests during the past year.

He then moved that the report and statement of accounts be received, adopted, and entered on the minutes.

Mr. G. W. CAREY (Deputy-Chairman) seconded.

The resolution was carried unanimously, without discussion.

DECLARATION OF DIVIDENDS.

The CHAIRMAN then proposed:

> That there now be declared dividends for the half-year ended Dec. 31, 1928 (being the final dividends for the year), as follows: On the preference stock, 5 p.ct. per annum; on the 5 p.ct. stock, 7½ p.ct. per annum; and on the 3½ p.ct. stock, 6 p.ct. per annum; all *less* income-tax (making, with the interim dividends already paid on the 5 p.ct. stock and 3½ p.ct. stock respectively, 7¼ p.ct. and 5¾ p.ct. for the year).

The resolution was seconded by Mr. FRANK H. JONES, and carried unanimously.

RE-ELECTION OF RETIRING DIRECTORS.

Mr. FRANK H. JONES, proposing the re-election of the retiring Directors (Mr. A. M. Paddon, Chairman, and Mr. G. W. Carey, Deputy-Chairman), said that the first duty of the Board after this general meeting would be to elect a Chairman and a Deputy-Chairman, so that if Mr. Paddon and Mr. Carey were not re-elected the remaining Directors would be in a difficult position. He felt sure the proprietors would not put them to any trouble in that respect.

Mr. T. W. SEAGER BERRY seconded, and the resolution was carried unanimously.

The CHAIRMAN, returning thanks for his re-election, said he had first joined the Board of the Company 29 years ago. It might be that there had been some deterioration in the value of the services he was able to render, but nobody had referred to it, and as the proprietors were re-electing him it seemed that they overlooked it.

Mr. CAREY also returned thanks.

RE-ELECTION OF AUDITOR.

On the proposition of Mr. K. R. MACKAY, seconded by Mr. F. W. CROSS, the meeting unanimously elected Mr. Hyde Clarke Burton (Chartered Accountant) an Auditor of the Company. Mr. MacKay paid a tribute to Mr. Burton, which was endorsed by the Chairman.

VOTES OF THANKS TO THE STAFF.

The CHAIRMAN, proposing a vote of thanks to the executive officers and staff of the Company for their services, said that all he had stated in proposing the adoption of the report and accounts was in itself a tribute to the executive officers, but inasmuch as the accounts were exceptional in their merits it should be pointed out how largely such results were dependent upon the efforts of the executive officers. The Company could not possibly have a more loyal, skilled, or devoted Chief Officer than Mr. J. W. Buckley (the Engineer and General Manager). As evidence of that, one need not do more than point to the selling price of the Company's gas—7¼d. per therm. Many companies were trying to sell at that price, but could not do it. Mr. Buckley was more than a maker and a distributor of cheap gas; he was most prescient and thoughtful in providing for the future and in keeping the Board advised as to matters which, if thought out in advance, could be dealt with more economically; he was an engineer of rare capacity, and if any doubted that they should see for themselves the holder which was being constructed under his supervision, which, when completed, would be a great tribute to

his skill. Mr. Mortimore (the Secretary) was also tireless in his endeavours to carry out all that was required of him, and the Board had great confidence in him.

Mr. E. L. BURTON seconded, and the vote of thanks was carried unanimously.

Mr. BUCKLEY, responding, paid a tribute to the technical staff who worked so ably under him, and to the workmen, who were exceedingly loyal. He had no doubt that co-partnership had been valuable, and he hoped it would continue. When he had joined the Company a little more than twenty years ago he had set himself two tasks; one was to sell cheap gas, if at all possible, and the second was to give the Board the minimum possible difficulty in achieving that object.

Mr. MORTIMORE also responded, and on behalf of the staff expressed appreciation of the vote of thanks.

VOTE OF THANKS TO THE DIRECTORS.

Mr. H. P. BODKIN, proposing a vote of thanks to the Chairman and his co-Directors for their able management of the affairs of the Company, pointed to the fact that only fifteen shareholders, out of a total of some hundreds, were present as showing that they were satisfied with the condition of the Company's finances.

Mr. F. W. CROSS, who seconded, said that by reason of his experience of gas matters he was able fully to appreciate all that was done by the Directors of the Company. He was sorry, however, that the attendance was so small, because, though there was no doubt that the shareholders were highly satisfied with the accounts and the dividends that had been declared, those who had not attended had, by missing the Chairman's address, missed a real pleasure.

The vote of thanks was carried unanimously.

The CHAIRMAN, in the course of his response, said he had noticed that as dividends increased the attendance at the general meetings decreased, and he added that if the Board were able to recommend a further advance in the future he supposed he could not look forward to seeing anybody at all at the meetings.

The meeting then closed.

BOURNEMOUTH GAS AND WATER COMPANY.

The 108th Ordinary General Meeting was held at the Offices of the Company, 48, Copthall Avenue, London, on Friday, Feb. 22—Mr. WILLIAM CASH (Chairman of the Company) presiding.

The SECRETARY read the notice convening the meeting, and also the minutes of the last ordinary general meeting.

The CHAIRMAN then moved the following resolution:

> That the Directors' Report and Account for the year ended Dec. 31, 1928, as presented at this meeting, be received and adopted.

Continuing, the Chairman said that the report summarized the main features of the business during 1928, but there were one or two items to which he wished to call special attention. As regards the capital account, during the past year two issues of capital were made—namely, £64,160 of 6 p.ct. preference stock, which was issued in November, and realized the satisfactory price of 112½, this being the issue price which the Directors fixed. Nearly £160,000 was applied for, so that it was evident the issues of the Company were popular with investors. There was also issued £60,000 5 p.ct. debentures, which, together with the previous issue, realized net to the Company £129,194. Even with these capital issues, however, the capital was overspent to the extent of £87,777; and therefore the proprietors would not be surprised to hear that they were to be asked to authorize the issue of further capital at such times as might be necessary. This would probably be in the near future. The expenditure during the year was a little over £100,000, and the principal expenditure was in connection with the gas undertaking in respect of a new gasholder having a capacity of 5 million c.ft., carburetted water gas plant, and the completion of the property in Christchurch Road. The expenditure upon the water undertaking had been in connection with new mains and filtration plant. During the past year a considerable portion of the moneys in the reserve and and pensions funds had been invested.

INCREASED GAS SALES.

Turning to the revenue account, the report gave the comparative figures for 1927 alongside the figures for 1928; and it would be seen that the sales of gas showed a decrease in money to the extent of £27,000, due, of course, to the fact that the price of gas was reduced during the year. The reduction was more in money, so far as the consumer was concerned, by reason of the fact that there was an actual increase in output of 2¼ p.ct.; and the Directors regarded this increase as not at all unsatisfactory; particularly bearing in mind the very mild weather conditions which prevailed during last summer. Meter rentals showed an increase of £813, but, like other undertakings, the revenue from residuals showed the considerable drop of nearly £16,000. On the other hand, coal and oil, notwithstanding the larger quantity of gas sold, were less by £23,500.

There was a variation in the form of the accounts, continued the Chairman, which needed explanation. Under the heading of "Repairs and Maintenance of Works" there was an apparent saving of £15,720; but, as against this, under the provisions of the Company's Act of Parliament last year, there were new charges for special purposes fund and for renewal fund, which together came to the sum of £8413. Parliament last year gave the Company power to set up these funds, which were common; and, having got that power, it was proposed to exercise it in the way he had stated. There was also a saving of nearly £6000 on repairs of mains; and the final result, making allowance for the reduction in price, was that the profit on gas for the year was somewhat down.

In the case of the water undertaking, the same remarks as to special purposes and renewal funds applied as in the case of the gas undertaking; and the combined profits on the gas and water undertakings amounted to £130,815, compared with £143,353 a year ago. The allocations to the special purposes and reserve funds accounted for £13,000 of the difference.

INCREASED DIVIDEND.

As he had pointed out at previous meetings, the Company had a method of its own, in a sense, for providing in advance a calculated sum for retort renewals; but this arrangement, of course, ceased at June last, because there were now the special funds to which he had referred. In the retort renewals fund there was accumulated £38,000. Still speaking of the profit and loss account, the Chairman said it would be seen that similar allocations to those made a year ago had again been made in various directions. For instance, £10,000 had again been allocated to the co-partners' pension fund—an amount which on actuarial advice was regarded as an appropriate sum to provide to put the pension fund on a proper basis. The Company had also availed itself of its Parliamentary rights in carrying a sum of £10,000 to reserve—a repetition of the policy adopted in 1927. As regards the Parliamentary expenses involved in getting the Company's Act through Parliament last year, the sum in the accounts represented the whole of those expenses, including certain incidental expenses in connection therewith—as for example, making payments to certain landowners whose interests were prejudicially affected. The satisfactory feature in connection with the whole of this matter was that the Bill passed unopposed; and consequently it was not necessary to spend a large sum in fighting it in Committee, all the local authorities being satisfied with the provisions put before them. The other gratifying feature from the shareholders' point of view was the decision to increase the dividend from 8½ p.ct. to 9 p.ct. Under the sliding-scale, as it stood at present, the Company could pay even more; but the Directors liked to couple increased dividends with reductions in price of gas, and he was happy to say it was intended still further to reduce the price of gas as from March 31 next. The price at present was 9d. per therm, and it was intended to reduce it by 0·2d. per therm, or about 1d. per 1000 c.ft. The addition to the dividend this year gave the co-partnership a little more in the way of bonus. The bonus followed the dividend; and he would say at once that he was sure the co-partners and the officials of the Company thoroughly deserved any small addition which they might get in that way.

On the balance-sheet, the Company found itself in a very satisfactory position. There were cash and calls due a day after the balance-sheet—and, of course, they had all been paid—amounting to £50,000; and the reserve fund of £120,000 has been more freely invested during the year. Indeed, it was hoped to do more in this way in the future. Of this sum, £53,000 was invested outside the business. The pension fund stood at £134,000; and of this, £107,000 was invested. A year ago the pension fund stood at £105,000, of which only £32,000 was invested. Then there were a retort renewal fund, the special purposes fund, and the new renewals fund, which amounted to a little over £50,000.

Referring specifically to the Act which the Company obtained last year, the Chairman referred to the advantages which it conferred as regards the water undertaking, and spoke of the steps taken to ensure a plentiful and wholesome supply of water to Bournemouth, mentioning also the continuous testing carried out both by the officers of the Company and the officials of the Local Authority.

In connection with the revaluation now going on for the purpose of local rating assessment, it was observed that it was possible there would be increased assessments, though there was the hope that this would be somewhat off-set by a lower rate in the pound.

EFFECT OF THE FROST ON GAS SALES.

Dealing again with the details of the gas undertaking, the Chairman spoke of the continued pushing of the sale and hire of apparatus. Referring to the recent cold spell, he said Bournemouth, like other places, had experienced an enormously increased demand for gas. The maximum daily output during the current year had been 12½ million c.ft., whereas the maximum daily output during the whole of last year was 11 million c.ft. As a matter of fact, the sale of gas during the current year showed extraordinary figures. On the whole of last year there was an increased sale of 48 million c.ft.; but down to Feb. 20 of this year the increased sale, as compared with the corresponding period of last year, was 92 million c.ft., merely on those seven weeks, a most extraordinary record. On one day Mr. Moon, their Engineer and Manager, had had to meet a demand of 60 p.ct. above the corresponding day of last year, when, of course, the weather was substantially milder than it had been this year. A satisfactory feature was that during this time of strain and stress the officials and the workpeople had met every demand completely.

During 1928, the number of new consumers was 1676, and the Company sold 11,000 pieces of apparatus of various kinds. It was also satisfactory to note that there was not a single new house built in the Company's district which did not have provision for a gas supply, though, of course, there were houses with both gas and electricity. There had been laid 23½ miles of new mains; and it was essential, in view of the figures he had mentioned, that the gas-works should be further extended.

CHANGES IN THE DIRECTORATE.

The year 1928 had been an unfortunate one for the Company in one respect. He was alluding to the alteration in the Directorate. In July last they suffered the loss of their colleague, Sir Charles

Jessel. Those who knew him would appreciate that they had lost a man with a most charming personality, a delightful colleague to work with, and a man of great business capacity. At the end of the year, Mr. Honoratus Lloyd informed the Board that the state of his health compelled him to resign from the Board. Mr. Lloyd was one of the leading Parliamentary Counsel, a man with the widest experience of the law and practice relating to public utility undertakings, and he was a tower of strength to the Board. Both these gentlemen served the Company well, and in respect of both of them the Board felt they had sustained a very severe loss. The endeavour had been made to exercise a wise choice in filling the vacancies; and he believed it had been successful. They had invited Mr. J. J. Withers to succeed Sir Charles Jessel. Mr. Withers was a very experienced lawyer with a wide, all-round knowledge of men and matters. He sat in the House of Commons for an important constituency, Cambridge University; he was a Director of other Companies, and his legal knowledge would replace the loss that had been sustained in the retirement of Mr. Honoratus Lloyd. When Mr. Lloyd retired, the Board asked Sir George Jessel to join the Company. He had financial knowledge very similar in one sense to that of his father. He was Director of a very large Company, the Imperial Continental Gas Association, so that he knew something about gas; and he was partner in a prominent City firm where he could help and advise on all matters relating to finance. Therefore he hoped the proprietors would approve the choice the Board had made. Sir George Jessel, who took the place of Mr. Lloyd, would retire and come up for re-election; and he hoped the meeting would confirm the Directors' earlier action by unanimously re-electing Sir George.

Sir CHARLES L. MORGAN (Deputy-Chairman) seconded the motion for the adoption of the report and accounts.

Mr. PALMER mentioned the fact that the unaccounted-for gas in 1928 was a considerable improvement on that of the previous year. At the same time, he noticed that the expenditure on meter repairs and renewals had increased by £2000; and he presumed that to some extent this expenditure was reflected in the smaller quantity of unaccounted-for gas.

The CHAIRMAN replied that the figure for renewal and repairs of meters must vary from time to time having regard to the state of the meters, the numbers brought in, changes of occupation, and so on. It was true that expenditure on meters had a beneficial effect on the actual recording of the gas and would assist in helping to reduce the leakage. This question of leakage was one which had been very much debated in the industry. It was in a measure due to some question of temperature; and it was satisfactory to note that the unaccounted-for gas last year had diminished in quantity.

The resolution for the adoption of the report and accounts was then passed unanimously.

The CHAIRMAN then moved the following resolution:

> That the interim dividends paid for the half-year to June 30, 1928, at the rate of 6 p.ct. on the preference shares, 7 p.ct. on the "B" shares, and 8½ p.ct. on the original shares, all *less* income-tax, be and the same are hereby confirmed.
>
> That dividends be paid for the half-year ended Dec. 31, 1928, at the rate of 9 p.ct. per annum on the original shares, at the rate of 7 p.ct. per annum on the "B" shares, and at the rate of 6 p.ct. per annum on the preference shares, all *less* income-tax.

Lieut.-Col. HAROLD WOODALL seconded, and the motion was passed unanimously.

On the motion of Sir CHARLES L. MORGAN, seconded by Mr. J. J. WITHERS, the meeting unanimously re-elected Mr. William Cash Chairman of the Company.

On the motion of the CHAIRMAN, seconded by Sir CHARLES MORGAN, the meeting unanimously re-elected Sir George Jessel to the Board of Directors.

Mr. TAYLOR proposed that Mr. R. H. Glen be re-elected one of the two Auditors of the Company, and that the remuneration of the two Auditors should be increased from £200 per annum and travelling expenses each to £250 per annum and travelling expenses.

The motion was seconded and carried unanimously.

The CHAIRMAN proposed a hearty vote of thanks to the officers, staff, and other employees of the Company, which was seconded by Mr. W. B. PATON, and carried unanimously.

Mr. P. G. G. MOON, Engineer and General Manager, who acknowledged the vote of thanks, spoke in terms of high praise of the devotion and loyalty of all employed by the company.

EXTRAORDINARY GENERAL MEETING.

An extraordinary general meeting followed the ordinary general meeting.

The CHAIRMAN proposed the following resolutions:

> That the Directors be and are hereby authorized to raise additional capital in accordance with the provisions of section 9 of the Bournemouth Gas and Water Act, 1928, by the creation and issue of 10,000 shares of £10 each, either in new 5 p.ct. shares (carrying a standard rate of dividend of 5 p.ct. per annum) with sliding-scale of dividend, or new ordinary shares, or new preference shares, or wholly or partially by one or more of those modes respectively limited as to the new ordinary shares, as to dividend in any one year to the sum of £7, and as to the new preference shares, to £6 respectively for every £100 actually paid up on such shares, exclusive of any sum paid by way of premium.
>
> That the Directors be and are hereby authorized to exercise the borrowing powers of the Company under the provisions of section 13 of the Bournemouth Gas and Water Act, 1928, by the creation and issue of irredeemable debenture stock to an amount not exceeding £50,000, and that such debenture stock be issued at such times, in such amounts and manner, on such terms and conditions, and with such rights and privileges as the Directors shall think fit.

Both resolutions were seconded by Sir CHARLES MORGAN and carried unanimously.

A vote of thanks to the Chairman and Directors closed the meeting.

AMALGAMATION OF DUDLEY AND BRIERLEY HILL CONCERNS.

Mention was made in our Feb. 13 issue (p. 434) of an agreement having been signed by the Directors of the Town of Dudley Gas Light Company and the Brierley Hill District Gas Light Company with a view to an amalgamation of the two Companies. The agreement is now subject to the shareholders' consent, which is to be sought at an extraordinary meeting of the proprietors to be held following the annual general meeting on Feb. 27.

For many years there has been an interchange of ideas between the two Companies, but it was felt by the Directors that it was to the advantage of all interests, consumers, shareholders, and employees of both Companies, that the two undertakings should be more closely allied. The Dudley Company has an annual sale of gas of approximately 300 million c.ft., and its area of supply practically coincides with Dudley Borough, covering some 3600 acres. The Brierley Hill Company has an annual sale of 128 million c.ft., but its statutory powers cover some 20,000 acres, including Himley, Wombourne, Kingswinford, Kinver, and Quarry Bank. The development of the Dudley Company in its own area is by no means exhausted, particularly in view of the extension of the borough and the commencement of the Priory Estate scheme. But the addition to the area of the very extensive powers of supply of the Brierley Hill Company in country that is also rapidly developing is obviously a valuable future asset, and assures the continued progress of the Company. Moreover, the combination of the Companies must also be to the interests of the consumers of the smaller Company. Careful scientific control in the manufacture of gas and—of equal if not greater importance—its distribution, wider facilities for consumers for the acquisition of cooking and heating appliances, and all the conveniences of service afforded by up-to-date gas companies are more easily secured within the wider scope of the larger Company.

Owing to the size of each Company, it will not be possible, nor is it intended, to close down either works. Both will continue to manufacture and distribute gas. At a time of depressed trade such as now, this must be considered advantageous, as no unemployment will result—rather the contrary is anticipated. But it does, of course, preclude any anticipation of immediate large reductions of price due to manufacture in bulk. There is no doubt reductions in price will eventually result due to the economies that can be effected by central buying, management, &c., but these must be a matter of time.

FINANCIAL ARRANGEMENTS.

With regard to the financial arrangements, the scheme of amalgamation is based on the distribution to the existing proprietors of both Companies, on completion of the amalgamation, of stock of the amalgamated Company to such an amount as will in each case at the specified rate of dividend yield to the proprietor the same return as has been received hitherto on the nominal amount of stock or shares now held by him or her. To give effect to this intention, the capital of the Dudley Company will be increased and reorganized. It is to be converted into two classes of consolidated stock—namely,

(1) ordinary capital called "5 p.ct. consolidated ordinary stock;" and
(2) preference capital called "5 p.ct. preference stock."

These stocks will be distributed among the Dudley proprietors as follows:

> Holders of original ordinary shares and "A" ordinary shares will receive for each share £60 of 5 p.ct. consolidated ordinary stock.
>
> Holders of "B" and "C" ordinary shares will receive for each share £20 of 5 p.ct. consolidated ordinary stock.
>
> Holders of new ordinary stock for each £100 will receive £140 5 p.ct. consolidated ordinary stock.
>
> Holders of preference shares will receive £30 of 5 p.ct. preference stock for each share.
>
> Holders of new preference shares will receive for each share £27 of 5 p.ct. preference stock.

The consideration to be paid for the Brierley Hill Gas undertaking will be satisfied by the issue to that Company of:

(1) £88,810 5 p.ct. consolidated ordinary stock of the Dudley Company for distribution to the holders of the ordinary stock and shares of the Brierley Hill Company;
(2) £1280 5 p.ct. preference stock of the Dudley Company for issue to the holders of preference stock of the Brierley Hill Company; and
(3) by the Dudley Company taking responsibility for the existing mortgages of the Brierley Hill Company, which total £22,000, and which will be secured by a charge on the amalgamated undertaking.

With the exception of the mortgages referred to, the assets of the Brierley Hill Company as they existed on Jan. 1, 1929, will be acquired by the Dudley Company free of mortgages, debentures, and other similar charges. The Brierley Hill undertaking will be deemed to have been carried on for the benefit of the Dudley Company as from the first day of January, 1929.

GAS ENGINEER FOR MANCHESTER.

£2250 Salary Offered.

The Establishment Committee of the Manchester Corporation on Friday last considered a proposal by the Gas Committee that a chief engineer for the Gas Department should be advertised for at a salary of £2250 a year.

It was decided to recommend the City Council to accept the proposal.

IMPERIAL CONTINENTAL GAS ASSOCIATION.

Parliamentary Bill.

At a special meeting of the Imperial Continental Gas Association, convened for to-morrow (Thursday) afternoon, the stockholders will be asked to approve a Bill, which it is intended to promote in Parliament this session, to re-incorporate the Association with wide powers in regard to the supply of gas and electricity.

The preamble sets out that the Association has large works in various cities and towns on the Continent of Europe, and holds shares in companies possessing gas and electrical undertakings in other cities and towns; but it is declared expedient that the objects of the Association should be extended and its powers enlarged.

The Bill therefore proposes to repeal the Acts under which the Association is now constituted, but to continue its incorporation under the same name. The powers and objects set out include the right to supply exclusively or in conjunction with any other company, gas, electricity, or other means of heating, "whether now known or hereafter to be discovered" within any foreign country or in any part of His Majesty's Overseas Dominions. The objects also include the purchase of any similar undertakings within the same world-wide area, and the promotion and assistance of "British or foreign companies, syndicates, associations, and undertakings of all kinds," and the distribution among the members of the Association of the securities of other companies belonging to it.

The unissued capital, which amounts to £400,000, is, by reason of the repeal of the existing Acts, cancelled, and the present authorized capital is declared to be £1,976,000, all of which has been issued and has been paid up. Power is now sought to increase the share capital by the creation of shares of such amounts as is thought expedient, in accordance with the provisions of the new by-laws of the Association.

By the Bill the Association or the Board may at any time capitalize and distribute (*a*) any sums which have been applied out of revenue to the extension and improvement of its works, or (*b*) any undivided profits standing to the credit of any of the reserve funds, or which may be otherwise available for distribution, including any sums in the nature of accretions to capital.

GASWORKERS AND TRADE UNIONS.

The excellent relationship existing between the Portsmouth Gas Company and their employees was frequently touched upon at the meeting held at the Company's Club Room on Feb. 22, in connection with the Joint Industrial Council for the industry, for the purpose of urging employees not already in their Trade Union to join.

Mr. J. COWARD, who presided, said the meeting demonstrated that their employees were prepared to recognize and utilize to the full the advantages which could be obtained by dealing with organized labour. He hoped they would be able to convince those employees outside the organization that they should join, and he felt bound to comment upon the splendid spirit of the Directors of the Company, who had loaned the room for the meeting. While others were talking about peace in industry, the Portsmouth Gas Company were showing how it could be obtained.

Councillor T. COCHRANE, of the Southern Regional Gas Joint Industrial Council, stated that 95 p.ct. of the gas undertakings of the country were organized. The industry had gone beyond individual bargaining, and had reached the stage of collective bargaining. They got on splendidly with the management of the Portsmouth Gas Company; and he only wished the consideration shown by this body of employers extended into all the other industries. Wage conditions were 100 p.ct. better in the gas industry that they were in 1914, and he contended that the trade unions had had a great deal to do with bringing this about, though he did not belittle the generosity of the employers. Gas was now meeting with such serious competition from electricity, however, that big changes might be made to reduce production costs in the future; and he urged that in the circumstances it was necessary that the men should have some body to watch their interests.

Alderman WILL THORNE, M.P., Vice-Chairman of the National Joint Industrial Council for the gas industry, and General Secretary of the workers' organization, congratulated the Portsmouth Gas Company upon providing so well for the social welfare of the employees. It was sometimes thought that such amenities were provided with the ulterior motive of preventing employees from joining their Trade Union; but he felt that this was not the case in Portsmouth. The Joint Industrial Council for the gas industry was formed in 1919, and improvements in conditions were still taking place. The danger which faced them in the future was the possibility of a reduction of wages to decrease costs, and this would be strenuously resisted; but the position of the employees in the industry would be strengthened if they were 100 p.ct. organized. Under the De-Rating Bill there was a likelihood that the bye-products of private gas undertakings would be handicapped, and the undertakings would have to decrease either their dividends or their expenses. He therefore appealed to all workers to join their Union.

CONTINENTAL UNION GAS COMPANY, LTD.

At an Extraordinary General Meeting to be held on Tuesday next, the Continental Union Gas Company, Ltd., will submit resolutions for increasing and reorganizing their capital.

In a circular letter to the shareholders, it is stated that the reorganization scheme has been rendered possible by a very advantageous sale of the Company's largest asset, its holding of shares in the Compagnie L'Union des Gaz. It had been feared that, as the result of the stabilization of the franc at about one-fifth of its pre-war value, and the consequent reduction of income from the French investments when converted into sterling, it might be necessary to face a reduction of the Company's capital. By virtue of this sale any need to reduce the capital is avoided, and there is a surplus. The sale, which was completed on Feb. 19, shows a capital profit sufficient to enable the Company to issue £200,000 bonus stock, increase its reserves to £100,000, and make provision for a staff pension fund. It has also rendered unnecessary the exchange reserve account.

The Company's assets now consist almost entirely of its general investments and the proceeds of the above sale. The Company has been a Holding Company for many years; but, whereas the principal object, when it was formed in 1864, was the acquisition of gas undertakings, and the greater part of its investments has been in such concerns, experience has shown that more stable results can be obtained by extending the general investment side of its business.

In these circumstances, the Directors, who have wide experience on the Boards of other well-known and successful Trust Companies, are unanimously of opinion that it is in the best interests of the stockholders that the Company should be reorganized, and carry on business in future on the lines of a modern Trust Company, increasing the very limited powers of the existing Memorandum of Association in modern form, and having equal amounts of ordinary stock and 5 p.ct. preference stock.

The details of the proposals may be summarized as follows:

(*a*) The capital of the Company (now £1,000,000, of which £200,000 is in 7 p.ct. non-cumulative participating preference stock, and £800,000 in ordinary stock) to be increased to £1,200,000, divided into £600,000 5 p.ct. cumulative preference stock and £600,000 ordinary stock. One-half of this £600,000 5 p.ct. preference stock will be held by the present holders of the 7 p.ct. preference stock, and the other half, with all the £600,000 ordinary stock, by the present ordinary stockholders.

(*b*) Each holder of preference stock will have in exchange for his existing holding new 5 p.ct. cumulative preference stock at the rate of £150 of such new stock for each £100 7 p.ct. non-cumulative preference stock now held. Owing to the increase in the nominal amount of his stock, he will thus get a larger income, notwithstanding the reduction in the rate of dividend.

Each holder of ordinary stock will have ordinary and preference stocks at the rate of £75 ordinary stock and £37 10s. 5 p.ct. cumulative preference stock in place of each £100 ordinary stock now held.

(*c*) The Memorandum of Association of the Company is to be altered by the adoption of a new objects clause in place of the present limited powers. This will require the sanction of the Court.

(*d*) New Articles of Association are to be adopted.

(*e*) The name of the Company is to be changed to "The Continental Union Trust Company, Ltd."

The sale of the controlling interest in L'Union des Gaz involves the resignation of Directors and other officials of that Company, who will be compensated, apart from the purchase money for the shares.

EXTENSIONS AT THE TREDEGAR GAS-WORKS.

"W.-D." Continuous Verticals.

At a meeting at the Tredegar Council, a letter was read from the Ministry of Health stating that, in accordance with the recommendation of the Board of Trade, it had been decided to comply with the Council's application to borrow for the extension of the gas-works. Formal consent was given for the borrowing of £13,760 for a vertical retort plant, and £724 for a weighbridge and oxide plant. A sum of £516 included in the application in respect of the cost of piled foundations had been excluded, as it was understood that these would not be necessary. However, the Department requested to be informed of the result of further trial holes when the existing retorts have been demolished and before the new foundations were put in hand.

Mr. A. P. J. GOUGH (the Financial Officer) said he thought that about £4000 could be released from the Council's gas revenue account, leaving approximately £10,000 to be borrowed.

In reply to questions, he stated that the profit on the gas undertaking during the past twelve months had been about £1400; but this amount had been made because the Council had done no maintenance work during that period. A fair average for a normal year for maintenance work was £600, so that, if the ordinary maintenance work had been carried through, last year's profit would have been reduced to £800.

It was resolved that the tender of the Woodall-Duckham Vertical Retort and Oven Construction Company, Ltd., be accepted for the erection of a vertical retort plant; it was also carried that the tender of Messrs. Samuel Dennison & Son, Ltd., be accepted for the supply and erection of the weighbridge.

GAS COMPANIES' RESULTS FOR 1928.

Almost Universally Increased Output.

ABERYSTWYTH.

The report of the Directors of the Aberystwyth Gas Company for the year ended Dec. 31, 1928, states that this is the first report following on the installation of vertical retorts at the works, and it affords complete satisfaction to the Directors and to the Engineer as justifying the change in the carbonizing process. It is proposed to pay the usual dividends (rates per annum) as follows: On original shares at the rate of 15 p.ct.; on the new shares at 10½ p.ct.; on the preference shares at 5 p.ct.; and on debenture bonds (interest) at 4½ p.ct. The revenue account shows a total expenditure of £8103, which, with £2913 carried to the profit and loss account, makes a total of £11,017. Receipts from the sale of gas amount to £8502. The profit and loss account totals £3160, of which £1500 has been transferred to the suspense account, leaving the sum of £1660 to be carried forward to the next account.

BARNET.

The sales of gas by the Barnet District Gas and Water Company show an increase of 1½ p.ct. over the year 1927. The price of gas was reduced from 11d. per therm to 10·5d. per therm at March 31, 1928, and a further reduction to 10·2d. per therm was made at Sept. 30 last. Under the powers conferred on them by the Company's Acts of 1926 and 1928 the Directors have inaugurated a contributory pension scheme for officers and workmen, which came into full force from Jan. 1, 1929. After placing to renewals (gas and water) funds the authorized contributions, writing off a proportion of Parliamentary costs, the payment of debenture and other interest, an interim dividend at the authorized rate of 7 p.ct. per annum, and the placing of £3500 to general reserve, there remains a balance of available profit of £45,812. The Directors now recommend the declaration of a dividend, *less* income-tax, for the half-year ended Dec. 31 last of 7 p.ct. per annum on the ordinary stock, leaving to be carried forward a sum of £27,519.

BATH.

At the Annual Meeting of the Bath Gas Company, on Feb. 20, Mr. E. Stanley Taylor took the chair for the first time, having succeeded Sir Percy Stothert, who, while retaining his seat on the Board, has been obliged to vacate the chair through ill health. Sir Percy joined the Board in 1893. The Chairman, in the course of his speech, brought out the following facts. The sum of £14,000 less had been expended, partly due to cheaper coal and oil, and also to improved working results. But £12,000 less, owing to lower prices, had been obtained for residuals. On the other side of the account, £16,000 less had been received for the sale of gas, due to the lower price charged. The net profit amounted to £20,865. The results were very satisfactory, and the Company was never in a sounder position. The consumption per consumer was the highest in the country, with the exception of Birmingham, being 265 therms per consumer. The number of consumers had increased by 447. There had been record coke sales during the year. The maximum dividend was ordered; and a tribute paid to the staff and officials. Mr. J. Wesley Whimster (the Engineer) said that during the cold spell all records for output and sales had been broken. The consumption figures were up by 50 p.ct. Mr. W. Blundell, Secretary, answering a shareholder, stated that gas companies were excluded from de-rating, whereas tar distilleries were included. The result would be unfair to gas companies, who competed with their products in the open market. The Gas Council had made every effort to induce the Government to include the manufacture of residuals in the measure, but they would not hear of it, and he was afraid they must put up with it. Mr. Blundell added that the Company had had an opportunity of watching a full year's working of the new system of sending out accounts in place of collecting them. The change had been an unqualified success. The accounts went out a month earlier and the money came in earlier, and bad debts, always small, had decreased still further.

BLYTH.

The Directors of the Blyth Gas Company present the following report for the year ended Dec. 31, 1928. The revenue amounts to £43,720, and the expenditure to £34,962, leaving a profit on the year's working of £8757. The Directors recommend that a dividend of 3⅞ p.ct., *less* income-tax on the ordinary stock, be paid, making —with the interim dividend paid in August last—7¾ p.ct. for the year 1928, and that the balance of £5798 be carried forward to the next account.

BRIDGEND.

In their report for the year ended Dec. 31, the Directors of the Bridgend Gas Company state that the expenditure on capital account was £1587, mainly in the extension of mains and otherwise making provision for the supply of gas to new consumers, and they contemplate a larger expenditure under this head to meet the requirements of further new consumers during the year 1929. The profit and loss account showed a balance of £1642. This was less than the balance in last year's account, by reason of (*a*) an expenditure of about £800 on the very necessary rebuilding of the river wall, and (*b*) the reduction in the price of gas made in April last. Out of the balance the Directors recommend a dividend at the rate of 5 p.ct. per annum on the preference and ordinary shares for the past half-year. These payments, after the deduction of income-tax thereon, will absorb the sum of £596, leaving the balance of £1045 to be carried forward to the next account.

BRIDLINGTON.

Mr. J. O. Wentworth, who presided at the Annual Meeting of shareholders of the Bridlington Gas Company on Feb. 12, expressed satisfaction at the success of the co-partnership scheme, by means of which more than one-half of their workpeople would become shareholders this year. Dividends of 16 p.ct. on the original shares, and 14 p.ct. on the additional and new capital, were sanctioned.

BROMSGROVE.

At the Annual Meeting of the Bromsgrove Gas Light and Coke Company on Feb. 18, presided over by Mr. John Green, a disposable balance was reported of £3836. Dividends were declared of 10 p.ct. on the original shares and 7 p.ct. on the "B" shares, leaving £1694 to be carried forward. The Chairman recalled that this was the diamond jubilee of the Company, which took over the works in the year 1869. In reviewing the progress of the Company, Mr. Green, who has been a Director throughout the sixty years, said that the make of gas had gone up from 5 million c.ft. to 124 million last year. The price to consumers had been reduced from 5s. to 4s. 2d. per 1000 c.ft. during the same period, though the cost of coal had gone up from 10s. a ton to 25s. a ton. Rates and taxes during the first year of the Company's existence amounted to £21, and last year to £2012, while the expenditure on salaries and wages had risen from £307 to £4335. Maintenance of works and mains last year cost £5373, compared with £141, and the relative expenditure on coal was £11,920 against £547. The works had been practically reconstructed, and 45 miles of mains laid. In spite of the competition of electricity, the make of gas last year showed an increase of 5 million c.ft., following a similar increase in 1927.

BRYNMAWR AND BLAINA.

The sixty-third Ordinary General Meeting of the Brynmawr and Blaina Gas Company was held at the Gas Works Offices, Blaina, on Thursday, Feb. 21; Alderman Lieut.-Col. J. G. Bishop, O.B.E., presiding over a representative meeting of shareholders. The statement of accounts showed a total income of £13,533; total expenditure £12,335, with a net profit of £1197. The Directors recommend the payment of a further dividend of 2½ p.ct., *less* income-tax, on the £10,000 5 p.ct. cumulative preference stock, and also a further dividend of 2½ p.ct., free of tax, on the £10,800 ordinary stock, making a total dividend for the year of 5 p.ct. The report and recommendation were adopted. Appreciative remarks were made regarding Mr. L. Murray, the Manager, for the excellent results obtained during the year, also the Secretary, Mr. D. A. Price, for the low outstanding figures in a district which was so depressed, and the staff generally for the results achieved during the year.

CANNOCK AND HEDNESFORD.

The annual report of the Cannock, Hednesford, and District Gas Company shows that the total receipts on the revenue account amounted to £35,851; and the Directors recommended the payment of a dividend at the rate of 8 p.ct.

CHESTER.

The 117th Ordinary General Meeting of the Chester United Gas Company was held at the new offices, Chester House, Northgate Street, on Wednesday, Feb. 13; Sir John M. Frost, J.P. (Chairman), presiding. The Directors' report for 1928 states that the sales of gas have still further increased. The price was reduced on March 31 last from 9d. to 8d. per therm. The Directors arranged the purchase in February last of the central premises, Chester House, Northgate Street, for purposes of showrooms and offices. The coke plant has been improved; and considering the necessary provisions that have been made, the profit on the year's working is satisfactory. The Directors recommend the payment of an extra dividend of ¾ p.ct. on the ordinary stock over the basic dividend, making 5¾ p.ct. for the year. The balance of net revenue is £14,200 after payment of interest and dividend on debenture and preference stocks, and the interim dividend on ordinary stock. The amount required for dividend will be £5344, leaving £8855 to carry forward. The Chairman, in proposing the adoption of the report and accounts, which were taken as read, said that from the end of March last they were able to reduce the price of gas by 1d. per therm to the present price of 8d. per therm, following a previous reduction of 1d. in March, 1927. Assuming the quantity of gas sold during the year under review to be the same as the previous year, the receipts would be approximately £8400 less. They were only down, however, by £6600, and the difference to the good of about £1800 was accounted for by increased sales throughout the year. It was here where the Company's progress year by year was shown. In quantity it was of the substantial figure of nearly 10 million c.ft. The increase was in every section of the sales, ordinary meters, slot meters, power supplies, and public lamps. Coke yielded £2800 below 1927, due, in the first place, to a substantial drop in price in the early part of the year; and, secondly, to reduced quantity sold in the later period of the year. Tar was down by £530, occasioned by a slight drop in the selling value of pitch; and the return from sulphate of ammonia was £550 below that of 1927, but £200 better than 1926. The balance on revenue account was carried to profit and loss account, and after payment of interest on temporary loans, at present a rather large sum, interest on debenture stocks and dividend on preference stock, and the 5¾ p.ct. dividend, as recommended, on ordinary stock, they would carry forward nearly £9000. They had every reason to be once again highly pleased with their position. In conclusion, the Chairman offered a tribute of thanks, as from the Directors and proprietors, to the staff for their co-operation in assisting to achieve such steady and consistent development.

CLEVELAND.

The profit made by the Cleveland Gas Company during the half-year to Dec. 31, 1928, has been £910, to which must be added the amount brought forward from last half-year of £3197, making the

balance at the credit of the profit and loss account at Dec. 31, 1928, £4108, which sum the Directors propose should be disposed of as follows: In paying a dividend at the rate of 3 p.ct. per annum (*less* income-tax) for the half-year; to the contingent fund (making it £8700) the sum of £200, leaving to be carried forward to next half-year's account £3310. During the half-year, the Directors have entered into an agreement with the Skinningrove Iron Company to supply the Cleveland Gas Company with what gas they require from the coke ovens at Skinningrove, and this is now in satisfactory operation. An agreement has been entered into with the Brotton Gas Light and Coke Company, to take over a small portion of their district adjoining the Company's area, and a Board of Trade Order is being obtained to bring this into effect.

DOVER.

The Bill which the Dover Gas Company promoted in Parliament last year received the Royal Assent in August. The Act fixed the basic price of gas at 13d. per therm, and the basic rate of dividend at 7½ p.ct. per annum. The Act also contains several other provisions which, it is believed, may be of considerable benefit to the Company. A co-partnership scheme has been instituted, and the Directors are pleased to be able to state that all the employees of the Company, 16 years of age and over, have agreed to become members. This will enable many of the employees to become proprietors in the Company, and should tend to cement the good feeling which has hitherto existed between the management and the workmen. The price of gas has been reduced from 1s. to 10·4d. per therm as from the commencement of the current quarter. The accounts for the year show that there is an available balance of £10,231, out of which the Directors recommend a final dividend at the rate of 3¾ p.ct., *less* income-tax, making, with the interim dividend paid in September, the full statutory dividend of 7½ p.ct.

EASINGWOLD.

Mr. George Sandham presided at the Annual Meeting of shareholders of the Easingwold Gas Light and Coke Company. The accounts showed a divisible balance of £622, and a dividend of 7½ p.ct., free of income-tax, was sanctioned. The Chairman congratulated the shareholders and all connected with the Company on another successful year.

EASTBOURNE.

The Directors of the Eastbourne Gas Company submit the following report for the year ended Dec. 31, 1928. After payment of an interim half-yearly dividend in September last, and providing for the payment of interest and all standing charges, there is a balance of £23,944 at the credit of the profit and loss account. The Directors recommend the payment of the full statutory dividends for the second half of the year—viz.: At the rate of 5 p.ct. per annum upon the £3150 5 p.ct. preference stock; at the rate of 8½ p.ct. per annum upon the £65,000 "A" stock, making a rate of £8 7s. 6d. for the year; and at the rate of 7 p.ct. per annum upon the £198,000 "B" stock, making a rate of £6 17s. 6d. for the year. These dividends will absorb the sum of £9771, leaving a balance of £14,173 to carry forward. The business of the Company has continued to make steady progress; 500 additional consumers have been secured; and the considerably increased gas consumption of the two preceding years has been more than maintained. The operations of the Company have been extended to the district of Hellingly; and an additional main has been laid to the Pevensey area, to meet the increasing demands for gas. Owing to the reduction in the price of gas at Midsummer by 0·4d. per therm, the accounts show a reduction in the gas rental; the receipts from residuals also show a falling off. On the other hand, it has been possible to effect a reduction in the price of coal, which largely compensates this loss of revenue.

GLOUCESTER.

The accounts of the Gloucester Gas Light Company show a satisfactory working through the year, and the increase in the sale of gas was 36,390·90 therms (or 7,826,000 c.ft.), equal to 1½ p.ct. The Directors recommend the payment of a dividend of 5 p.ct. per annum for the year ended Dec. 31, 1928, on the consolidated ordinary stock of the Company (*less* income-tax), of which an interim dividend for the half-year ended June 30, 1928, has already been paid. Since the last meeting £7500 of the £15,000 consolidated ordinary stock of the Company remaining to be offered to the public was sold by auction on June 15 last at an average price of £89·4 p.ct. There is therefore still £7500 to dispose of.

HARTLEPOOL.

The profit for the year of the Hartlepool Gas and Water Company, including £14,117, the amount brought forward from last year, amounts to £52,841. After paying interest on mortgages, debentures, &c., and an interim dividend of 2½ p.ct., *less* tax, there remains an available balance of £29,788, out of which the Directors propose to declare a final dividend of 2½ p.ct., *less* tax (making 5 p.ct. for the year) absorbing £14,640, and leaving a balance of £15,148 to carry forward to the next account. The trading results have again been satisfactory, notwithstanding the phenomenal industrial depression which has obtained throughout the year.

LEATHERHEAD.

The Directors of the Leatherhead Gas and Lighting Company submit the following report for the year ended Dec. 31, 1928: To meet the expenditure in connection with the considerable expansion of the Company's business, the Directors, in April last, issued £30,000 in 6 p.ct. irredeemable preference stock. The new showrooms, offices, workshops, and stores which are being constructed on the site of "The Old Bull" Inn, North Street, Leatherhead, are progressing satisfactorily, and will be ready for occupation during the summer. The sale of gas shows an increase of nearly 5 p.ct. The Company's mains have been extended 7775 yards, and 264 new services laid on. After providing for interest and all other charges, the accounts show a balance of £7483, from which have to be deducted interim dividends paid in September, 1928—viz., 3 p.ct. on the irredeemable preference stock; 3½ p.ct. on the redeemable preference stock; and 2½ p.ct. on the ordinary share capital (all *less* tax), leaving a net profit of £5090. The Directors recommend the confirmation of the above-mentioned dividends and the payment of further dividends at the rate of 3 p.ct. and 3½ p.ct. on the preference stocks, making the maximum rates of 6 p.ct. and 6½ p.ct. per annum respectively on those stocks, and 4½ p.ct., making, with the interim dividend of 2½ p.ct. paid in September, 7 p.ct. per annum on the ordinary shares. These dividends (*less* tax) will absorb £4179, and leave £910 to be carried forward to the next account.

LOSTWITHIEL.

At the Annual Meeting of the Lostwithiel Gas Light and Coke Company, Ltd., over which Mr. J. H. Jeffery presided, the Directors' report, recommending a dividend of 7s. 6d. on the "A" shares and 1s. 6d. per share on the "B and "C" shares, was adopted.

MERTHYR TYDFIL.

At the sixty-first yearly Ordinary General Meeting of the Merthyr Tydfil Gas Company, at which Dr. T. W. Scale presided, statutory dividends of 2½ p.ct. on the 5 p.ct. preference stock and of £4 11s. 3d. p.ct. on the consolidated ordinary stock were declared payable at the close of the meeting. The Chairman, in his remarks, stated that the sales of gas were less than those of the previous year, due principally to the restriction in public lighting.

NEWPORT (MON.).

Presiding at the Annual Meeting of the Newport (Mon.) Gas Company on Feb. 4, Mr. G. Geen, J.P., the Chairman, said that there had been a net increase on the year of 404 in the number of actual consumers of gas within the Company's area of supply, indicating a continuance of the growth of potential business, which had been a marked feature of recent years. This necessarily had meant considerable expenditure on mains, meters, stoves, and appliances, as well as for labour, the effect of which was reflected in the year's accounts. Sales of up-to-date appliances of various descriptions, both through the showrooms and the representatives, had been well maintained, and the showroom window displays continued to attract marked attention, and to form the subject of frequent favourable comment in the town. They were desirous that through such agencies, and by other means, their 19,000 odd customers should possess themselves of the latest and most economical apparatus available, being assured that only thus would they derive the greatest possible satisfaction from the use of gas. To put it concisely, service and satisfaction were their aim. In conclusion, the Chairman said he had yet again to pay a tribute to the capacity and efficiency of the officials and staff. Mr. Canning and his assistants consistently maintained the works and plant of the Company in a highly satisfactory condition, and admirably directed the operative side of the undertaking, while the Secretary's Department was equally well served by Mr. Stanford and his staff. Sir Garrod Thomas, D.L., seconded the adoption of the report, which was carried unanimously.

SOUTH SHIELDS.

The report of the Directors of the South Shields Gas Company for the past year shows that the revenue amounts to £140,187, and the expenditure to £118,146, leaving a profit of £22,040, added to which is the balance from the previous year of £14,050, making a total profit of £36,091, which it is proposed to apportion as follows: Year's dividend on consolidated and new stocks at 8½ p.ct. per annum, *less* income-tax; year's dividend on ordinary stock at 5¾ p.ct. per annum, *less* income-tax; year's interest on mortgages, &c., after payment of which, a balance of £14,057 is left to be carried forward. Owing to the continued trade depression in the Company's area of supply, there has been a decrease of 1·88 p.ct. in the sale of gas. The profit for the year amounts to £22,040, as against £21,918 for the previous year—an increase of £122. As from the March reading of the meters to the end of the year the price of gas was reduced by 2⅔d. per 1000 c.ft., or ½d. per therm.

WELLINGBOROUGH.

The profits of the Wellingborough Gas Light Company, after providing for income-tax, interest, and certain expenses in connection with the issue of shares, amount to £4267. This, added to the balance of £6415 brought forward from last account, makes an available balance of £10,682. The Directors recommend that out of this sum dividends of 7½ p.ct. on the original and 6 p.ct. on the additional shares, *less* income-tax, be declared for the half-year. They also recommend that the sum of £250 be carried to the reserve fund. This transfer and the payment of dividends and tax thereon will absorb the sum of £4096, leaving a balance of £6585 to be carried forward. The price of gas will be reduced by 3d. per 1000 c.ft., or 0·65d. per therm, from the reading of meters at the beginning of April next.

WHITBY.

The Directors of the Whitby Gas Company submit the following report for the year ended Dec. 31, 1928. The profit and loss (or net revenue account), after charging the same with interest on debenture stock, interest on preference stock, and interest on deposits, and after providing for the interim dividend paid to June 30 last, shows a balance of £3833, out of which the Directors recommend the payment of dividends at the rate of 3 p.ct., *less* income-tax, on the original capital, and of £2 2s. p.ct., *less* income-tax, on the additional and new additional capital, for the half-year ended Dec. 31, 1928, making with the interim dividends paid for the half-year ended June 30, 1928, 6 p.ct. on the original capital, and £4 4s. p.ct. on the additional and the new additional capital for the year. This will absorb £918, leaving a balance of £2915 to carry forward. The sale of gas shows an increase over last year of 829,000 c.ft. The price was reduced in April last. The new showrooms and offices, opened in November last, have been greatly appreciated by customers, and have resulted in increased sales of gas apparatus. The premises lately occupied by the Company in Baxter-

gate have been disposed of. During the year 224 new consumers have been connected up. New mains have been laid in various parts of the town to meet the increased demand for gas.

WORTHING.

The report of the Directors of the Worthing Gas Light and Coke Company for the year ended Dec. 31 states that the Company's business continues to grow; the total quantity of gas sold showing an increase of 6⅓ p.ct. as compared with the previous year. The Directors have raised during the year £26,139 by the issue of £25,000 5½ p.ct. irredeemable preference stock; £1215 consolidated ordinary stock to the co-partners; and £1200 5½ p.ct. mortgages. The profit and loss account shows a balance of £36,529, after transferring £1000 to the reserve fund. The Directors have paid dividends (*less* income-tax) of 5½ p.ct. per annum on the preference stock and 7 p.ct. per annum on the consolidated ordinary stock for the half-year to June 30, 1928, and now recommend the declaration of dividends (*less* income-tax) at the rate of 5½ p.ct. per annum on the preference stock and 7 p.ct. per annum on the consolidated ordinary stock of the Company for the half-year to Dec. 31, 1928. During the year the Directors reduced the price of gas to 10·6d. per therm as from the March quarter, and to 10d. per therm as from the September quarter, and have decided further to reduce the price to 9·6d. per therm (4s. per 1000 c.ft.) from the March quarter, 1929.

YEADON AND GUISELEY.

Mr. Thomas Parsons, Chairman of the Yeadon and Guiseley Gas Company, presided at the half-yearly meeting of shareholders, on Feb. 13. Profits for the past year totalled £5509, and £5706 was brought forward. Interest charges absorbed £3236, and final dividends of 7⅛ p.ct. on the "A" stock, and 5¼ p.ct. on the "B" stock were sanctioned, making 12½ and 8⅜ p.ct. on the respective classes for the year. The Chairman said that the output of gas had shown little decrease, being 644,944 therms, which was 15,928 therms less than the previous year. The introduction of electricity usually resulted in a reduced output of gas for two or three years, and afterwards progressive increases obtained. The Company were on the point of proving the accuracy of that view.

SANDOWN GAS AND COKE COMPANY, LIMITED.

Application for a Special Order.

An application by the Sandown (Isle of Wight) Gas and Coke Company, Ltd., for a Special Order under section 10 of the Gas Regulation Act, was the subject of an inquiry on Friday, Feb. 15, at the Board of Trade Offices, Westminster, by Mr. J. F. RONCA (Director of Gas Administration at the Board of Trade). The principal objects of the proposed Order are to authorize the raising of additional capital to the extent of £10,000, and the extension of borrowing powers to half the issued capital, and to extend the area of supply. There are a number of general administrative clauses in the Order.

Mr. Jacques Abady was Counsel for the promoters. The only opponents were the Shanklin Gas Company, who already have powers to supply in part of the parish of Newchurch, and who objected to the proposal that the powers in respect of this area should be transferred to the Sandown Company. The Shanklin Company was represented by Mr. S. Turner.

Mr. JACQUES ABADY said that this Order on behalf of the Sandown Gas and Coke Company, Ltd., had various objects, and the only one that was opposed was the clause in the Order extending the limits of supply and the consequential extinction of certain powers now possessed by the Shanklin Gas Company. These were two neighbouring Companies, and he believed they were on very good terms. The clause of the Order which was the subject of opposition was to extend the limits of supply with respect to a part of the parish of Newchurch and to revoke the powers of the Shanklin Gas Company with respect thereto. The Shanklin Gas Company had had powers since 1907, and had not exercised them; and by section 5 of the Shanklin Gas Act of 1907, the Board of Trade could give those powers to someone else if the circumstances referred to in section 5 had not been effected. Though an application had been made for the supply, this had not been given, and he therefore asked the Board to give the Sandown Company powers to supply that area. He was asking for powers to supply an area which some other gas company was at present authorized to supply, and in the ordinary way the Board would have no power to grant that; but the provisions in the Shanklin Gas Act of 1907, in his submission, did give the Board the power to grant the power to another company. Section 5 of the Shanklin Gas Act of 1907 stated that if at any time after the expiration of seven years from the commencement of that Act the Company were not prepared within six months after receiving a request in writing to provide the gas in the area referred to, the local authority of the district or any other company might apply for an Act of Parliament or a Provisional Order for the purpose of supplying gas in any part of such district not so supplied by the Company. He asked the Board to assume that the Company had not within seven years from the commencement of their Act been affording or supplying, or were not prepared within six months after receiving a command in writing so to afford the supply, and he wanted them to assume that he could prove that that was the position at the date of the application of the present Order. If those circumstances were true, then the position was that his application for a Provisional Order was in order, because he was entitled under the terms of the Gas and Water Works Facilities Act in respect of a district in which there was no supply authorized, to apply for a Provisional Order, and the Board could grant it. The Shanklin Company had forfeited their right to the monopoly they obtained, as they had powers which they had not exercised; and the Board could proceed as if they had not those powers. Their application for powers was made on Oct. 19, 1928, and he thought it would be common ground that at that date the Shanklin Company was not, in the area concerned, affording a supply of gas. It was also common ground that prior to Oct. 19, 1928, the Shanklin Company did receive a demand calling on them to afford the supply, and they had not been prepared, in the six months after receiving the demand, to afford the supply. On June 3, 1926, the application for the supply was made by 114 inhabitants of the villages in the district, and no supply was given to them within the six months allowed for by the Act. He assured the Board that there was a substantial demand for the supply. He understood that since the date of the application for the Order the Shanklin Company had commenced the work of laying portions of gas mains which they eventually proposed to couple up, and he supposed they were doing that to show the Board of Trade that they were complying with the provisions of section 5 of their Act of 1907. That did not matter, even though they could show a length of main since the date of the Sandown application. The point was that if there was no supply within the area before the date of their application, then the jurisdiction of the Board of Trade arose under section 5.

PETITION FOR GAS BY INHABITANTS.

Counsel then read the petition signed by 114 inhabitants of the districts of Abse Heath and Newchurch, and pointed out that an agreement was also entered into between the Sandown Company and the Shanklin Company for the supply of gas to Alverstone Village by the Sandown Company. The agreement for that was made on Nov. 12, 1927. The Shanklin Company had written to the 114 petitioners on July 9, 1926, that they could not give a supply, and they were showing, by entering into the agreement on Nov. 12, 1927, that they could not give the supply to Alverstone Village, which, if they intended to give the supply to Abse Heath and Newchurch, could have been made by running through those two places.

Mr. *Robert Streeter Faulkner* (the Engineer and Manager to the Sandown Gas and Coke Company) pointed out that their works were in good condition, and they were asking for further capital with the view to still further improving the works. During the last few years the Company had made very material progress. Since the Order had been deposited, the Shanklin Company had laid a portion of a 4-in. main, but it was not connected with the consumers' premises—unless that had been done within the last few days.

In cross-examination, Mr. Faulkner admitted that the application from the 114 people had not the support of the local authorities.

Mr. *Frank Charles Taylor* (Engineer and Secretary of the Shanklin Company) pointed out that the petitioners for the gas supply came from a very wide district. Before the application for the Order was made the Shanklin Company had laid new mains towards Newchurch, and since then they had been extended. At present there were thirty-six men at work, and they anticipated that with favourable weather they would reach Newchurch within a month. The Directors had resolved that the work should be pressed on, not only to Abse Heath and Newchurch, but to Godshill. The position that day was that they were supplying 19 houses at Abse Heath, and they were in a position to connect up any other premises.

Mr. Taylor admitted, in cross-examination, that they had discussed with the Directors of the Ryde Company the engineering details of how an amalgamation could be carried out, but they had no definite plan at present. With regard to the extension of supply, they had plenty of retort capacity.

Mr. TURNER, in the course of his remarks on behalf of the Shanklin Gas Company, pointed out that a great deal of play had been made of the fact that they had been busy since the application for the present Order was made. He agreed, but they had to take into consideration the position at the present day. It was their territory and they were entitled to develop it as and when they could. If the Board of Trade granted the Order they would be taking away territory from an undertaker who would have developed it by the time the Order became effective and would be giving it to other undertakers; he could not suggest any kind of public advantage that would result from the making of the Order. The demand by the petitioners specified no terms, and no date by which the supply was required, which should be the case in accordance with the provisions of the Gas and Water Works Facilities Act of 1871. He submitted that the promoters were not entitled, by reason of section 5 of the Shanklin Company's Act of 1907, to go for a Special Order; if they wanted to proceed under section 5 they were bound to go for an Act of Parliament or a Provisional Order, and in the present case the Board had no power to make a Special Order giving the promoters a piece of the Shanklin district. They were now in the area and were supplying Abse Heath, and in a few weeks' time they would be in Newchurch. The work was being pushed on, and any Order which might be granted in favour of the Sandown Company would do no good to any person in that area. There could be no question that if the Order was granted its effect would be to override the agreement which was made by the two Companies in 1927 in respect to the supply of Alverstone. He submitted that if it had been intended by the promoters to override that agreement, then that was a matter which should have been mentioned by them in their Notice when applying for the present Order; but no mention of it was made.

Mr. JACQUES ABADY further addressed the Director, who will make his decision later.

THE TOLL OF THE WEATHER.

Frost Causes Temporary Failures in Gas Supply.

The long spell of severe frost caused the plates in the roof of the gasholder at Mytholmroyd to buckle and be wrenched off on Feb. 18, resulting in escape of the gas, the collapse of the holder, and the isolation of the district so far as its gas supply was concerned. Fortunately the escape of gas was not accompanied by an explosion. An alternative gas supply was secured for the affected district on the day following the mishap, by connecting up to the main from the holder at Hebden Bridge.

The theory suggested as to the cause of the mishap is that one of the arms supporting the holder became frozen fast during the night of Sunday, Feb. 17. When gas was withdrawn on the Monday the holder would be left temporarily suspended by that arm, and the weight eventually tore the arm and plate from the socket. As the gas escaped the holder fell into the water tank, buckling and wrenching out of position four or five other arms and plates. The collapsed holder became completely frozen in the water tank. The loss is expected to be fairly heavy. A repair gang was quickly on the scene from Messrs. Robert Dempster & Sons, Ltd., of Elland, while the workmen of the Hebden Bridge and Mytholmroyd Gas Board concentrated on cutting off the Mytholmroyd main and linking up to that direct with Hebden Bridge. The Mytholmroyd main was cut because the valve intended for closing the main was so frozen that it would not function properly.

The staff of the Hebden Bridge and Mytholmroyd Gas Board, knowing the liability to frost effects in the exposed district of Mytholmroyd, had been at very great pains in the effort to prevent such effects. Men had been at work all day on the Sunday keeping the holder clear of ice by means of steam pipes, and when they left at night everything appeared to be perfectly satisfactory.

In the Bentham (North-West Yorkshire) district the frost caused a temporary discontinuance of the gas supply. At an early hour on Feb. 18 an inlet pipe inside the water tank within No. 1 gasholder at the town's gas-works burst, causing the flooding of the retort house to a great height, extinguishing all fires, and cutting off the gas service.

Denton was without light for two nights in succession. It appears that the failure of the gas supply was due to the freezing of the pipes between the retort house and the holders, this having followed the bursting of a 6-in. main and the breaking of one of the gasholder guide chains. Most of the hat factories in the town, where considerable quantities of gas are used, had to be closed down for a short time.

Of the 7000 street gas lamps in Bolton, 6000 were put out of action by the frost; over 40 men being constantly engaged thawing them. Only once previously have the Lighting Department been so seriously affected, which was 34 years ago.

The Gas Department received complaints of frozen meters at the rate of 500 or 600 a day.

TRADE NOTES.

Industrial Gas Utilization.

Premix Gas Plants, Ltd., of London, announce that the Company have been placed on the Admiralty List for all industrial gas heating purposes.

W. Cory & Son, Ltd.

Messrs. W. Cory & Son, Ltd., and their Associated Companies, of Cory Buildings, Fenchurch Street, E.C. 3, announce that their telephone number will now be Monument 2500 (twenty lines).

C. L. Stiff & Co., Ltd.

Messrs. C. L. Stiff & Co., Ltd., of 89, Albion Street, Leeds, announce that they have transferred their office to new premises erected at their works, and the address now is—C. L. Stiff & Co., Ltd., East Ardsley, near Wakefield. Telephone—Morley 108; telegrams—"Stiff," East Ardsley.

Better Street Lighting by Gas.

The lanterns in use in Doncaster, fitted with Holophane two-way directional refracting plates, as described in Mr. Robert Watson's article on "Directional Gas Lighting for Streets" in our last week's issue, are 18-in. "Falcon" square storm-proof copper lanterns, supplied by Messrs. Hutchinson Bros., Ltd., of Barnsley and Doncaster.

Fleming Safety Goggles.

Eye protection in industry is undoubtedly a subject which has interest for a large section of our readers, and we note that Messrs. J. & R. Fleming, Ltd., of Clerkenwell Road, E.C. 1, have published a new illustrated list of industrial eye protectors, helmets, and respirators which have been carefully designed for safety and comfort in particular classes of work. The glasses have been produced as the result of careful experiments made to ascertain the precise nature of the risk and the most suitable form of glass to provide satisfactory protection against that risk.

Wilton Sulphate of Ammonia Plant for Japan.

The Chemical Engineering and Wilton's Patent Furnace Company, Ltd., have received an order from the Sumitomo Fertilizer Company, of Japan, for a sulphate of ammonia plant of 100 tons per day capacity; the design to be exactly as that of the plant inspected at Edinburgh. The latter is the latest type of sulphate of ammonia plant, whereby the salt is handled mechanically without centrifugal machine. The Company have also received an order from Messrs. Burt, Boulton, & Haywood, Ltd., for a small plant of similar type for their Silvertown Works.

COAL TRADE REPORTS.

From Our Own Correspondents.

NORTH-EAST COAST.

With better arrival of shipping, trade has been active during the past week. The demand for all kinds of fuel is strong, and it is thought that the recent shortage of supplies to many Continental ports will take some considerable time to make good. Business has been booked for the whole of March at the recent higher prices, and inquiry is still good for April. Collieries are holding out for current prices, but buyers are inclined at present to hold off in the hope of an ease in the market.

Gas coals are busy under seasonal demand, and Wear Specials are firmly held at 15s. 3d. to 15s. 6d. f.o.b. Best qualities quote 15s. to 15s. 3d., and good seconds are 14s. 6d. to 14s. 9d. There is still a strong demand for coking coals, and best qualities can get 15s. 3d.; some asking as much as 15s. 6d. for prompt. Best Durham unscreened bunkers are scarce, and quoted at 15s. 6d. for all positions; seconds being 14s. 6d. to 14s. 9d. Northumberland steams are as high as 16s. 6d. for best screened sorts, and are reported as fully booked for weeks ahead.

A feature has been a sudden spurt in gas coke, which has come into exceptional demand, and advanced to 21s. 6d. f.o.b., as compared with only 18s. 6d. a week ago.

YORKSHIRE AND LANCASHIRE.

There is a keener demand for coal of all descriptions, both for home consumption and for export. Values are firm, and vary in accordance with the position at the individual collieries, but an average increase of 1s. a ton is being obtained for prompt supplies. Contracts are being placed for a considerable time ahead. The demand for gas coal has increased, but supplies are still fairly adequate.

The following are the Humber bunker and export prices, f.o.b. usual shipping ports:

South Yorkshire—Hards, Association, bunkers 21s. 9d., export 20s.; screened gas coal, export 18s.; washed trebles, export 19s. 8d.; washed doubles, bunkers 19s. 9d., export 18s. 6d.; washed singles, export 17s.; washed smalls, bunkers 16s., export 13s. 6d.; rough slack, bunkers 14s., export 12s.; smithy peas, export 18s. 6d.

West Yorkshire—Hartley's (f.o.b. Goole), bunkers 18s. 9d., export 17s. 6d.; screened coal, export 17s. 6d.; washed trebles, export 18s.; washed doubles, export 17s. 6d.; washed singles, export 16s.; washed smalls, bunkers 15s. 3d., export 13s.; unwashed trebles, export 17s.; unwashed doubles, export 14s. 6d.; rough slack, bunkers 14s., export 11s.; coking smalls, export 11s.

Derbyshire and Nottinghamshire—Top hards, bunkers 21s. 9d., export 18s. 6d. to 20s.; washed trebles, export 18s. 6d.; washed doubles, export 17s. 6d.; washed singles, export 16s. 6d.; washed smalls, bunkers 15s. 3d., export 13s.; unwashed doubles, export 16s.; rough slack, bunkers 14s., export 12s.

Yorkshire, Derbyshire, and Nottinghamshire—Screened steam coal, bunkers 19s. to 20s., export 16s. to 18s.; gas coke, export 20s. to 24s.; furnace coke, export 20s. to 21s.; washed steam (Goole, West Yorks.), bunkers 18s. 9d.; Hull (West Yorks.), bunkers 19s. 6d.; Hull (South Yorks.), bunkers 19s. 9d., export 17s. 6d.

MIDLANDS.

The trade is taking some time to settle down after the confusion caused by the severe weather. Deliveries of all classes of coal fell into arrear. Demand for household qualities leapt up, while distribution became worse delayed. This reacted on other branches of the trade, and generally disorganization of supplies has resulted.

One effect is to emphasize the risks to which consumers are exposed by persistence in a policy of restricting reserves. Middlemen have suffered so heavily in recent years from speculative commitments against the contingency of a sudden decrease of demand that there has been a widespread tendency to leave the consumer to take care of himself.

The putting-up of prices against the householder in the prevailing dislocation has increased the difficulties of industrial consumers who have had to go on the market for emergency supplies. Otherwise there does not appear to be much fundamental disturbance of values apart from those which the advance of the season will adjust.

In this area the temporary removal of output restrictions under the Five Counties Scheme is having a good effect in regard to the overtaking of deliveries. The most noteworthy development is in the coke position. Indications point to the re-establishment of a balance between supply and demand, and blast-furnacemen no longer have the initiative in bargaining for new contracts. Quotations are firm on the basis of 14s. for good average grades.

CONTRACTS OPEN.

Coal.

The Chertsey Gas Consumers' Company invite tenders for the supply of gas coal and nuts. [See advert. on p. 625.]

Tar.

The Gas Committee of the Manchester Corporation invite tenders for the purchase and removal of the carburetted water gas tar to be produced at their Bradford Road Works. [See advert. on p. 625.]

Meters.

The Gas Committee of the Manchester Corporation invite tenders for the supply of gas meters. [See advert. on p. 625.]

Oxide.

The Gas Committee of the Manchester Corporation invite tenders for the supply of new and spent oxide and the purchase of spent oxide. [See advert. on p. 625.]

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

London, *Feb.* 25.

In the London tar products market chief interest centres at the moment in road tar, and considerable business is being booked for delivery over the coming season. Products generally remain without material change, and current values are as follows:

Pitch, 35s. to 36s. per ton; creosote, 6¾d. to 7d. per gallon; pure benzole, 1s. 9d. to 1s. 10d. per gallon; pure toluole, 1s. 11d. to 2s. per gallon; 95/160 solvent naphtha, 1s. 5d. to 1s. 6d. per gallon; pyridine, about 4s. 3d. per gallon.

Tar Products in the Provinces.

Feb. 25.

The average prices of gas-works products during the week were: Gas-works tar, 19s. to 24s. Pitch—East Coast, 32s. to 33s. f.o.b. West Coast—Manchester, 27s. to 27s. 6d.; Liverpool, 29s. to 30s.; Clyde, 29s. to 30s. Toluole, naked, North, 1s. 5d. to 1s. 6d. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 1½d. to 1s. 2d. Heavy naphtha, North, 1s. to 1s. 0½d. Creosote, in bulk, North, liquid, 4¼d. to 4½d.; salty, 3¾d. to 4d.; Scotland, 4¼d. to 4½d. Heavy oils, in bulk, North, 6d. to 6½d. Carbolic acid, 60 p.ct., 1s. 10d. to 1s. 10½d. prompt. Naphthalene, £13 to £15; salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

Benzole Prices.

The following are considered to be the market prices to-day:

	s. d.	s. d.	
Crude benzole . . .	0 10	to 0 11	per gallon at works
Motor ,, . . .	1 5	,, 1 6	,, ,,
90 p.ct. ,, . . .	1 7	,, 1 8	,, ,,
Pure ,, . . .	1 10	,, 1 11	,, ,,

Cheaper Gas for Lea Bridge.—Notice has been given of a reduction in the price of gas by the Lea Bridge District Gas Company from the date of reading the meters at Lady Day quarter, of 0·2d. per therm. The price will then be 8·4d. per therm.

Increased Assessment of Bradford Gas Department.—The recent revaluation of property in Bradford, under the Rating and Valuation Act, has produced big increases in the assessments of various Corporation properties. The Gas Department is faced with an increase of £11,808.

The Parent Coal Carbonisation Trust, Ltd., has been registered as a public Company, with a capital of £750,000. The objects are to adopt agreements with Maisel's Petroleum Trust, Ltd., and Fordhams' Trust, Ltd., and to acquire rights for the U.K. of Great Britain of a secret process for low-temperature carbonization of coal known as the Aicher process. The Directors are: The Rt. Hon. Lord Askwith, Mr. E. Cohen, and Mr. R. F. M. Scott.

Cardiff Gas Company's Athletic and Social Club.—The annual report on the progress of the club shows that the various sections continue to function successfully, and an enviable position has been achieved by the Association Football Section in the Third Division of the Cardiff and District League. The numerous competitions and tournaments have also been keenly contested. Through the generosity of the Directors of the Company the recreation ground at Grangetown is being extended.

National Gas Engine Company, Ltd.—The accounts for the past year, after making provision for depreciation of buildings, plant, machinery, &c., and for income-tax, show a balance at profit and loss of £72,440, and £24,609 was brought in, making £97,049. Dividend on preference shares, paid on July 31, 1928, absorbed £6000, leaving a divisible balance of £91,049. The Directors recommend a final dividend on the preference shares for the six months ended Dec. 31, 1928, at the rate of 5 p.ct. per annum, and a dividend at the rate of 7 p.ct. for the year on the ordinary shares, placing £20,000 to the general reserve, making that fund £70,000, and carrying forward £23,049.

Increase in Discounts at Warwick.—From the readings of the meters at Lady Day next the following rates of discounts will be introduced, on condition that the account is paid within 21 days from the date on which it is rendered. These allowances are made irrespective of the purpose for which gas is used. For consumption up to 25,000 c.ft. per quarter, 2½ p.ct.; for consumption of 25,000 c.ft. and under 50,000 c.ft. per quarter, 5 p.ct.; for consumption of 50,000 c.ft. and under 100,000 c.ft. per quarter, 7½ p.ct.; for consumption of 100,000 c.ft. and under 200,000 c.ft. per quarter, 10 p.ct.; for consumption of 200,000 c.ft. and under 300,000 c.ft. per quarter, 12½ p.ct.; and for consumption of 300,000 and upwards, 15 p.ct.

Illingworth Carbonization Report.—In the course of a long résumé of the progress of the Illingworth Carbonization Company, Ltd., the Directors state that at the present moment the cash at call or in the bank amounts to £36,000, and there are options at par during the next nine months over 75,000 shares which the Directors have been informed will be exercised. This will bring in additional capital amounting to £18,750. The negotiations which are in hand will require a large amount of this capital being expended in joint interests with other companies, and there are also other very large-scale financial operations under consideration. As the Company has the benefit of the co-operation of important financial houses, it is not anticipated that the Illingworth Carbonization Company will require to increase its capital for the moment, but in any issue of shares by subsidiary companies the Directors will arrange that the shareholders have an opportunity of participating on terms equal to any other interests.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Feb. 20.]

Nos. 4463—5297.

Bamag-Meguin Akt.-Ges.—"Gas producers." No. 4972.
Barrett Company.—"Operating gas retorts." No. 5240.
Blakeley, W.—"Gasholders." No. 5234.
Bowater, N. J.—"Gas manufacturing installations." No. 4709.
Fallon, J.—"Apparatus for carbonization of coal." No. 4507.
Heller, O.—See Bamag-Meguin Akt.-Ges. No. 4972.
Lymn, A. H.—See Bowater, N. J. No. 4709.
Poole, D. C. E.—"Gas meters." No. 4633.
Smallwood, A.—See Fallon, J. No. 4507.
Thomas, A. A.—"Gas blow pipe." No. 5220.
Vincent, G. & J.—"Geyser." No. 4840.
Wilson, J. H.—See Poole, D. C. E. No. 4633.

Ewart & Son, Ltd., Annual Meeting.—The Twenty-Eighth Annual General Meeting of Ewart & Son, Ltd., was held on Wednesday, Jan. 30; Mr. S. Ewart presiding. The Chairman said that the Directors recommended that the dividends on the preference and ordinary shares be declared and paid at the same rate as in the past years since 1925—namely, 16 p.ct. on the preference shares and 41 p.ct. on the ordinary shares. To earn a sum of over £50,000 net profit for the year 1928 under the very adverse conditions that had to be faced, the Chairman continued, was no small achievement, and in itself afforded proof of the whole-hearted co-operation and energy on the part of the men, staff, managers, and Directors of the Company. The assets, consisting of cash investments and sundry debtors, amounted to no less than a sum of over £147,000, to which, if they added stock and work in progress, reached the figure of £209,000, which more than covered the capital of the Company by nearly £30,000.

Gas Tragedy at Eastbourne.—A leakage in a gas main in Eastbourne on Feb. 15 was responsible for the death of five persons, residents of a flat at Ardarra Mansions, Winter Road. The victims were Mr. and Mrs. William Martin and their two daughters, who were found dead on the premises, and their son, who was removed to hospital unconscious, where he died subsequently. The children were all under the age of 10 years. About 8.30 in the morning neighbours were alarmed by a strong smell of gas in the vicinity, and complaints were sent to the Gas Company. Later, the Company's workmen found that the frost had cracked the gas main under the pavement outside Ardarra Mansions, and the escaping fumes had apparently filtered through the ground and up through the floor of the building. The victims were discovered by the workmen when they arrived on the scene. At the inquest on Feb. 20, evidence stated that two letters complaining of the escape had been sent to the Gas Company; and in returning a verdict of "Accidental death" the jury added a rider that they considered it unfortunate that there was a delay of nearly three hours from the receipt of the last letter until definite action was taken by the Company.

The gas consumption at Halifax during the cold period was 20 p.ct. above the normal, and constituted a record.

The Preston Brigade quelled a fire at the Preston Gas-Works on Feb. 17. A wood stage and oil tank were found in flames. The fire was caused through efforts to thaw frozen pipes.

The severe weather at Buxton during the cold spell resulted in an increased output of gas from the Corporation Gas-Works of over 45 p.ct. compared with the corresponding period of last year.

For the month ended Feb. 1 the output of gas at Blackpool was 89,610,000 c.ft.—an increase of nearly 5¾ million on last year, equivalent to 6¾ p.ct. During January, 59 new consumers were connected.

The Exmouth Urban District Council have engaged Mr. P. S. Hoyte, of Plymouth, to advise them in the matter of their opposition to the Exmouth Gas Company's application for a Special Order enabling them, among other things, to erect a gasholder and other works on a site forming part of the foreshore.

Eleven people were killed by an escape of gas in a night shelter in the Rue de Tocqueville, Paris, on the night of Feb. 18. One man was saved by the efforts of a doctor who was hastily summoned to the scene of the tragedy. The eleven other occupants of the shelter were past medical aid. The escape of gas was due to a pipe bursting under the action of the cold.

The gas consumption in Bradford during the period Feb. 11 to 20—the period of the frost—amounted to 15·5 p.ct. more than during the corresponding period of last year; and in order to cope with the unexpectedly big demand, retorts recently closed down at the Valley Road Works (with a view to a big reconstruction scheme there) had to be restarted.

The decision of the Clitheroe Gas Committee to meet the cost of new purifiers out of last year's profits provoked discussion at the Town Council meeting on Feb. 19. Mr. J. H. Satterthwaite thought the cost should be spread over a period of years by loan charges. It was unfair that one generation of consumers should pay for alterations that would last 60 years. Money to spare should be devoted to reducing the price of gas. Mr. R. Parker said profits were utilized to avoid delay entailed by a loan. The matter was urgent. Alderman J. Thornber (Chairman of the Gas Committee) said loan charges would result in an extra £3000 being paid in the long run. The Committee's recommendation was approved.

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr	Dividends. Last Hf. Yr.	NAME.	Quotations. Feb. 22.	Rise or Fall on Week.	Transactions Lowest and Highest Prices.
£			%p.a	% p.a.				
171,978	Stk.	Feb. 7	5	5	Aldershot 5 p.c. max. C.	70—75	..	..
412,999	,,	,,	4	4	Do. 4 p.c. Pref.	73—76	..	..
1,561,868	,,	Sept. 27	7	7½	Alliance & Dublin Ord.	99—102	..	100—102
374,000	,,	Jan. 10	4	4	Do. 4 p.c. Deb.	63—66	..	..
522,655	,,	Aug. 30	7	7	Barnet Ord. 7 p.c.	114—117	..	..
300,000	1	Oct. 11	1/7½	1/4½	Bombay, Ltd.	20/—22/-	..	21/6
172,500	10	Aug. 30	8½	8½	Bournemouth 5 p.c.	12½—13½	..	13½—13⅝
600,050	10	,,	7	7	Do. B 7 p.c.	12½—13	..	..
439,160	10	,,	6	6	Do. Pref. 6 p.c.	11—11½	..	..
50,000	Stk.	Jan. 10	3	3	Do. 3 p.c. Deb.	55—58	..	..
169,935	,,	,,	4	4	Do. 4 p.c. Deb.	74—77	..	..
357,900	,,	Aug. 30	7½	7½	Brighton & Hove 6 p.c. Con.	115—118	..	116½
241,880	,,	,,	6⅔	6⅔	Do. 5 p.c. Con.	101—104	..	103
1,387,500	,,	Feb. 21	5	5	Bristol 5 p.c. max.	91½—92½a*	—2	..
665,000	,,	Sept. 27	7	8	British Ord.	117—120	+1	119—120
100,000	,,	Dec. 20	7	7	Do. 7 p.c. Pref.	115—120	..	..
100,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	73—76	..	..
300,000	,,	,,	5	5	Do. 5 p.c. Red. Deb.	93—96	..	..
100,000	10	Dec. 6	8	8	Cape Town, Ltd.	8—9	..	..
100,000	10	Oct. 25	4½	4½	Do. 4½ p.c. Pref.	6¼—7¼	..	..
150,000	Stk.	Dec. 20	4½	4½	Do. 4½ p.c. Deb.	73—78	..	..
696,860	,,	Feb. 21	6	6	Cardiff Con. Ord.	95—98*	—2	98⅝
327,860	,,	Jan. 10	7½	7½	Do. 7½ p.c. Red. Deb.	98—101	..	102½
187,150	,,	Feb. 21	5	6½	Chester 5 p.c. Ord.	87½—92½b*	—2½	..
72,185	1	Oct. 11	1/2/-	1/2/-	Colombo Ltd. Ord.	36/—38/-	..	37/9—38/-
34,495	1	,,	1/4½	1/4½	Do. 7 p.c. Pref.	21/—23/-	..	..
375,402	1	Oct. 11	1/9½	1/9½	Colonial Gas Assn. Ld. Ord.	24/6—26/6	..	26/-
187,848	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	21/—23/-	..	22/-
2,073,280	Stk.	Feb. 21	5	7	Commercial Ord.	97—100*	—3	99—102
475,000	,,	Dec. 20	8	8	Do. 8 p.c. Deb.	56—59	..	58
950,000	,,	Sept. 27	11	11	Continental Union, Ltd.	125—135	+7½	123—131
200,000	,,	,,	7	7	Do. 7 p.c. Pref.	125—130	..	123½
787,550	,,	Feb. 21	7	7	Croydon sliding scale	109—112*	—2	113—113½
409,100	,,	,,	5	5	Do, max. div.	82—85*	—2	..
542,270	,,	Aug. 16	10	7	Derby Con.	115—120e	..	..
55,000	,,	Dec. 20	4	4	Do. Deb.	70—72e	..	..
909,000	,,	Aug. 30	5	5	East Hull Ord. 5 p.c.	75—78	..	..
1,002,180	10	Sept. 13	†6	†4	European, Ltd.	18—20	+3	15½—20½
18,708,480	Stk.	Feb. 21	5½	5⅝	Gas Light & Coke 4 p.c. Ord.	19/1½—19/7½f*	—/3	19/1½—19/9
2,000,000	,,	,,	3½	3½	Do. 3½ p.c. max.	64—66*	—1	66½
4,187,020	,,	,,	4	4	Do. 4 p.c. Con. Pref.	77—80*	—1	78—79⅜
5,609,630	,,	Dec. 20	3	3	Do. 3 p.c. Con. Deb.	58—61	..	59½—60½
181,815	,,	,,	6	6	Do. 6 p.c. Br'tf'd Rd. Db.	102—105	..	..
3,643,770	,,	,,	5	5	Do. 5 p.c. Red. Deb.	98—101	..	101½
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
89,500	,,	Aug. 30	6⅔	7	Hastings & St L. 5 p.c. Conv	95—100	..	..
258,740	,,	,,	5⅔	6⅔	Do. 6⅔ p.c. Conv.	75—80	..	..
70,000	10	Oct. 11	†10	†10	Hongkong & China, Ltd.	13—14	..	..
218,200	Stk.	Aug. 30	5	5½	Hornsey Con. 5½ p.c.	88—91	..	..
1,976,000	,,	Nov. 8	10	10	Imperial Continental Cap.	410—430	+20	405—428
338,180	,,	Feb 7	3½	3½	Do. 3½ p.c. Red. Deb.	69—72	..	70—71
285,342	,,	Aug 16	7	7½	Lea Bridge 5 p.c. Ord.	120—123	..	..
2,146,907	,,	Feb. 21	6½	6½	Liverpool 5 p.c. Ord.	93½—94½b*	+½	..
600,000	,,	Sept 27	7	7	Do. 7 p.c. Red. Pref.	101—103b	..	..
165,736	,,	Feb. 21	9	8	Maidstone 5 p.c. Cap.	121—126*	—3	..
63,480	,,	Dec. 20	3	3	Do. 3 p.c. Deb.	54—57	..	..
75,000	5	Dec. 6	†8	†8	Malta & Mediterranean	5⅜—6⅛	..	5⅞—6⅛
392,000	—	—	—	—	Metrop't'n (of Melbourne) 5½ p.c. Red. Deb.	100—103	..	..
841,930	Stk.	Nov. 22	†7	†5	Montevideo, Ltd.	97—100	..	99½
2,061,818	,,	Feb. 21	5	5	Newcastle & Gateshead Con.	16/9—17/6d/f*	—/4½	..
682,856	,,	,,	4	4	Do. 4 p.c. Pref.	74—75d	..	..
691,705	,,	Dec. 20	3½	3½	Do. 3½ p.c. Deb.	68—69d	..	..
131,780	,,	Aug. 30	6/18/0	7/1.0	North Middlesex 5 p.c. Con.	102—107	..	..
800,000	,,	Nov. 22	7	9	Oriental, Ltd.	116—120	..	118
189,120	,,	Dec. 20	7½	8	Plym'th & Ston'house 5 p.c.	108—111	..	..
424,416	,,	Feb. 21	7⅝	8⅝	Portsm'th Con. Stk. 4p.c. Std.	113—118*	—2	..
241,446	,,	,,	5	5	Do. 5 p.c. max.	81—84*	—2	..
2,334,464	1	—	—	—	Primitiva Ord.	36/—38/-	+2,6	28/—38/6
244,500	100	Dec. 8	4	4	Do. 4 p.c. Red. Deb.	91—94	..	..
695,000	Stk.	Jan. 24	4	4	Do. 4 p.c. Red. Deb. 1911	78—80	..	79⅛
416,345	,,	Dec. 20	4	4	Do. 4 p.c. Cons. Deb.	78—80	..	..
150,000	10	Sept. 27	6	6	San Paulo 6 p.c. Pref.	8⅜—8⅞	..	..
1,736,968	Stk.	Aug. 30	—	—	Sheffield Cons.	105—107e	..	..
95,000	,,	Jan. 10	—	—	Do. 4 p.c. Deb.	74—77e	..	..
90,000	10	June 14	:3	14	South African	4—6	..	..
6,609,895	Stk.	Feb. 21	5	7½	South Met. Ord.	106—108*	—2	108½—110
500,000	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	108—111*	—2	109—111½
1,895,445	,,	Jan. 10	3	3	Do. 3 p.c. Deb.	59—61	..	59⅜—60
784,000	,,	Sept. 13	6½	6½	Do. 6½ p.c. Red. Db.	101—103	..	102½
91,500	,,	Aug. 16	8½	8½	South Shields Con.	109—110d	..	..
1,543,795	,,	Feb. 21	6½	6½	South Suburban Ord. 5 p.c.	107—110*	—2	..
468,837	,,	Dec. 20	5	5	Do. 5 p.c. Deb.	98—101	..	..
647,740	,,	Aug. 30	5	5	South'mpton Ord. 5 p.c. max.	78—80	+1	78
131,375	,,	Dec. 20	4	4	Do. 4 p.c. Deb.	72—75	..	73—74
250,000	,,	Feb. 21	7	7	Swansea 7 p.c. Red. Pref.	99—101*	—2	..
200,000	,,	Dec. 20	6½	6½	Do. 6½ p.c. Red. Deb.	99—101	..	..
1,002,275	,,	—	—	—	Tottenham District Ord.	102—105	..	102½—103
150,000	,,	July 29	5½	5½	Do. 5½ p.c. Pref.	97—100	..	..
191,255	,,	Dec. 6	4	4	Do. 4 p.c. Deb.	75—78	..	..
289,094	,,	Aug. 30	6⅝	6⅝	Uxbridge, Maidenhead, & Wycombe 5 p.c.	95—100	+2	96½
98,330	,,	,,	5	5	Do. 5 p.c. pref.	87—92	..	..
80,000	,,	Feb. 21	8⅝	9	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c.	147—152*	+2	..
255,686	,,	,,	7½	7½	Do. B 5½ p.c.	125—130*	—2	126
433,585	,,	,,	6½	6½	Do. C and New	102—107*	—1	..
859,000	,,	,,	6½	7½	Do. Wimbledon 5 p.c.	115—120*	—2	..
98,000	,,	,,	7⅛	7⅛	Do. Epsom 5 p.c.	125—130*	—5	..
200,000	,,	,,	5	5	Do. 5 p.c. Pref	90—95*	..	..
88,416	,,	Dec. 20	3	3	Do. 3 p.c. Deb.	57—60	..	..
284,743	,,	,,	4	4	Do. 4 p.c. Deb.	77—80	..	78
207,500	,,	,,	5	5	Do. 5 p.c. Deb.	97—100	..	..

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See "JOURNAL," February 20, p. 557.

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Telegrams: "BRIPURIMAT ESTRAND LONDON." Telephone: CENTRAL 3982.

SULPHURIC ACID.
SPECIALLY prepared for the manufacture of SULPHATE OF AMMONIA.
SPENCER CHAPMAN & MESSEL, LTD.,
with which is amalgamated WM. PEARCE & SONS, LTD., 36, Mark Lane, LONDON, E.C. Works—SILVERTOWN.
Telegrams—"HYDROCHLORIC, FEN LONDON."
Telephone—ROYAL 1166.

OXIDE OF IRON.
SPENT OXIDE BOUGHT.
BALE & CHURCH, LTD.,
33, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Royal 1484.
"TORTO" FIRE CEMENT.
BALE & CHURCH, LTD.,
33, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Royal 1484.
"KLEENOFF," THE COOKER CLEANSER.
Tins for Sale to Consumers.
In Bulk for Works Use.
(See "Gas Salesman," p. 72.)
BALE & CHURCH, LTD.,
33, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Royal 1484.

MANCHESTER OXIDE CO., LTD.,
MILES PLATTING,
MANCHESTER.
TEL.: OXIDE, MANCHESTER. ESTABLISHED 1890
PHONE {5883 / 5884} CENTRAL.

FRESH OXIDE {ON SALE / OR LOAN.
BRITISH MAKE.
IMMEDIATE DELIVERY.
NO EXCESS MOISTURE.
IMMEDIATE ACTIVITY.
MINIMUM BACK PRESSURE.
MINIMUM EXPOSURES.
MINIMUM LABOUR

SPENT OXIDE PURCHASED
ON SULPHUR CONTENT.
ON **BLUE** CONTENT.

SPECIALISTS IN PURIFICATION.

GAS PURIFIED IN 1928
OVER 45,000 MILLIONS.

APPOINTMENTS, &c., VACANT.

TOWN OF DUDLEY GASLIGHT COMPANY.
DEPUTY ENGINEER AND MANAGER.

CANDIDATES for the Post are Hereby THANKED for their Applications. Communications have now been sent to those placed on the preliminary short list.
FRAS. C. BRIGGS, A.M.I.C.E., &c.,
Engineer and General Manager.
Gas-Works,
Dudley.

GUERNSEY GAS LIGHT COMPANY, LIMITED.
(CHANNEL ISLANDS.)
TO GAS ENGINEERS AND MANAGERS.

WANTED—An Assistant Manager, fully Qualified and Experienced, to take (under the direction of the Manager and during his absence) the Entire Charge of the Company's Works (about 180 Millions), including Distribution and Secretarial duties; capable of planning and carrying out all Additions, Extensions, Alterations, and Improvements to Works and Distribution Plant.

He must be an Associate Member of the Institution of Gas Engineers or prepared to qualify as such, produce exceptional References, find security to the extent of £500, and be prepared to Devote the Whole of his Time and Abilities to the Interests and Progress of the Company.

Commencing Salary, £350 per Annum.

Apply, stating Age, Training, Experience, and enclosing *copies* (non returnable) of not more than three Testimonials to

F. H. ARNOLD,
Manager.

Registered Office:
Smith Street,
Guernsey,
Feb. 8, 1929.

WANTED—Engineer and Manager for Gas undertaking in Eastern Counties making 450 Millions of cubic feet per Annum.

Commencing Salary not less than £800 per per Annum, dependent on the class of man engaged. Age preferably not more than 40 years.

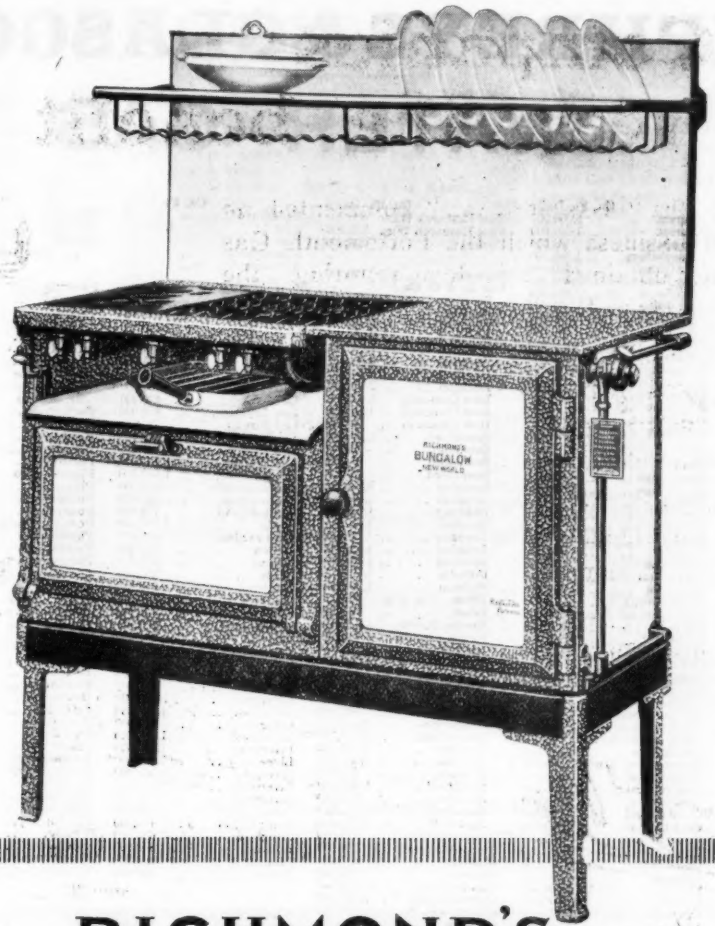
Applicants to send *copies* of Two Testimonials relating to capability and personal character together with the following:

Education and Academic Qualifications.
Manufacturing and Chemical Experience.
Distribution Experience.
Commercial and Administrative Experience.

Applications, stating inclusive Salary required, to be received not later than March 13, to No. 7943, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

WANTED—Chief Mechanical Engineering FOREMAN for a large Chemical Works. Must be a sound practical Man able to handle Labour. Good Wages and a Permanent job for a Man who can organize the Work.

Applicants should give Age, Experience, and Wages required to No. 7942, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.



RICHMOND'S
"BUNGALOW"
NEW WORLD RANGE

This New Range looks particularly handsome in "Rado" Porcelain-Enamel finish. "Regulo" controlled and fitted with single oven burner and direct bottom-flue-outlet. Note specially the convenient working space provided by the top of the oven being level with the hot-plate. The spacious self-contained warming chamber can be used as an auxiliary oven for low temperature cooking.

Labour Saving!

RICHMONDS GAS STOVE
COMPANY, LIMITED,
Radiation Ltd. WARRINGTON & LONDON Proprietors.

Rust Resisting

In Porcelain Enamel Finish

HUMPHREYS & GLASGOW, LTD.

WATER-GAS

	Cu. Ft. Daily
Aarhus	800,000
Abertillery	500,000
Abertillery	100,000
Admiralty:	
British	800,000
British	800,000
British	800,000
British	800,000
British	800,000
French	800,000
French	800,000
Agram	200,000
Aindrie	430,000
Aldershot	1,400,000
Aldershot	1,000,000
Aldershot	1,316,000
Alfmaar	400,000
Allenstein	280,000
Alost	740,000
Amersfoort	300,000
Amsterdam	1,000,000
Amsterdam	1,600,000
Amsterdam	2,700,000
Antwerp	1,500,000
Antwerp	1,900,000
Antwerp	1,500,000
Antwerp	1,900,000
Ascot	433,000
Ashford	250,000
Asnières	650,000
Augsburg	425,000
Aylesbury	150,000
Aylesbury	470,000
Banbury	200,000
Banff	125,000
Barmen	500,000
Barnsley	588,000
Barrow	300,000
Barrow	500,000
Barry	500,000
Barry	720,000
Bath	1,000,000
Bath	1,000,000
Bath	1,300,000
Belfast	1,700,000
Belfast	4,500,000
Belfast	1,250,000
Belfast	1,250,000
Belfast	2,250,000
Benrath	125,000
Berkhampstead	259,000
Berlin:	
Charlottenb'g	2,500,000
Danziger Str.	1,600,000
Neukoelin	650,000
Neukoelin	700,000
Schmargendorf	760,000
Tegel	3,500,000
Tegel	6,350,000
Tegel	245,000
Bideford	258,000
Bilston	375,000
Bilston	125,000
Birmingham:	
Adderley St.	675,000
Nechells	3,000,000
Nechells	3,000,000
Nechells	3,000,000
Swan Village	1,500,000
Windsor St.	3,000,000
Windsor St.	3,000,000
Bishop's Stortford	200,000
Bishop's Stortford	300,000
Bishop's Stortford	200,000
Blackburn	1,190,000
Blantyre	150,000
Blois	125,000
Blois	125,000
Bochum	530,000
Bogner	100,000
Bogner	423,000
Bo'ness	125,000
Boulogne	340,000
Bournemouth	1,000,000
Bournemouth	500,000
Bournemouth	1,500,000
Bournemouth	1,000,000
Bournemouth	500,000
Bournemouth	1,530,000
Bournemouth	2,000,000
Bournemouth	500,000
Bournemouth	2,750,000
Bremen	550,000
Bremen	950,000
Bremen	850,000
Brentwood	250,000
Brescia	588,000
Brest	550,000
Bridgwater	200,000
Bridlington	150,000
Bridlington	200,000
Bridlington	550,000
Brieg	100,000
Brierley Hill	250,000
Brighton	1,750,000
Brighton	1,850,000
Brighton	750,000
Brighton	2,750,000
Bristol	2,000,000
Bristol	2,500,000
Bristol	825,000
Bristol	825,000
Bromley	1,500,000
Bruges	200,000
Bruges	600,000
Brussels:	
Anderlecht	350,000
Anderlecht	350,000
Forest	1,000,000
Forest	1,000,000

	Cu. Ft. Daily
Forest	1,000,000
Forest	1,500,000
Forest	88,000
Koekelberg	1,000,000
St. Gilles	1,000,000
St. Josse	1,000,000
St. Josse	600,000
St. Josse	775,000
Ville	750,000
Ville	750,000
Ville	1,500,000
Ville	350,000
Bucarest	1,100,000
Buckie	164,000
Budapest	50,000
Budapest	1,750,000
Budapest	200,000
Budapest	250,000
Caen	250,000
Cambridge	500,000
Cambridge	1,000,000
Cardiff	2,000,000
Cardiff	3,000,000
Cardiff	1,950,000
Cardiff	600,000
Carlisle	600,000
Carlsruhe	500,000
Carnarvon	248,000
Charleroi	1,250,000
Châteauroux	125,000
Châteauroux	125,000
Châtelet	500,000
Chester	564,000
Chesterfield	430,000
Chesterfield	90,000
Chesterton	197,000
Chichester	250,000
Chorley	300,000
Cie. des Compteurs	1,150,000
Cie. Lorraine de Ch.	210,000
Cie. Mines de Roche	585,000
Coatbridge	400,000
Commercial, L'n	850,000
Commercial	850,000
Commercial	1,250,000
Commercial	2,000,000
Commercial	800,000
Commercial	2,100,000
Copenhagen	700,000
Copenhagen	2,500,000
Copenhagen	1,750,000
Courtrai	250,000
Coventry	600,000
Coventry	800,000
Coventry	1,250,000
Coventry	350,000
Cowdenbeath	420,000
Cracow	200,000
Cracow	200,000
Cranleigh	188,000
Crefeld	500,000
Crewe	700,000
Crewe	800,000
Crosfield & Sons	1,500,000
Crosfield & Sons	1,500,000
Crowborough	150,000
Croydon	1,250,000
Croydon	625,000
Croydon	625,000
Croydon	550,000
Croydon	650,000
Croydon	1,125,000
Croydon	150,000
Croydon	3,000,000
Deal	250,000
Deal	250,000
Debrecsin	100,000
Derby	1,500,000
Derby	2,000,000
Deventer	150,000
Deventer	200,000
Devonport	1,600,000
Devonport	1,100,000
Doncaster	1,350,000
Dorking	150,000
Dorking	300,000
Dorking	130,000
Dover	500,000
Dublin	2,000,000
Dublin	2,000,000
Dublin	650,000
Dudley	609,000
Dundee	1,500,000
Dunedin, N.Z.	275,000
Dunedin	275,000
Durham	200,000
Dusseldorf	1,000,000
Eastbourne	1,250,000
Eastbourne	1,550,000
Edinburgh	2,000,000
Eindhoven	1,500,000
Enschede	282,000
Epsom	225,000
Epsom	300,000
Essen	1,400,000
Essen-Borbeck	1,400,000
Exeter	1,100,000
Exmouth	376,000
Falmouth	150,000
Faversham	200,000
Flensburg	300,000
Flensburg	125,000
Forst	300,000
Frankenthal	175,000

	Cu. Ft. Daily
Fuel Research Wks.	500,000
Fuel Research Wks.	500,000
Furnes	500,000
Gabienz	140,000
Gas L. & C. Co.:	
Beckton	14,000,000
Beckton	7,000,000
Beckton	3,500,000
Beckton	7,000,000
Beckton	7,000,000
Beckton	5,250,000
Beckton	4,500,000
Beckton	3,000,000
Bow Common	1,000,000
Bow Common	1,150,000
Bow Common	150,000
Brentford	1,200,000
Brentford	850,000
Brentford	350,000
Brentford	750,000
Bromley	3,750,000
Bromley	2,250,000
Bromley	1,500,000
Bromley	1,000,000
Bromley	1,450,000
Bromley	1,350,000
Fulham	2,500,000
Fulham	1,700,000
Ilford	650,000
Ilford	750,000
Kensal Green	2,250,000
Kensal Green	2,250,000
Kensal Green	2,250,000
Nine Elms	2,750,000
Nine Elms	750,000
Nine Elms	1,870,000
Nine Elms	2,850,000
Shoreditch	900,000
Shoreditch	2,700,000
Shoreditch	2,725,000
Southall	2,000,000
Southall	3,000,000
Staines	600,000
Stratford	1,700,000
Stratford	850,000
Stratford	2,350,000
Stratford	2,350,000
Gelsenkirchen	175,000
Gelsenkirchen	350,000
Geneva	509,000
Geneva	700,000
Gennevilliers	10,600,000
Gennevilliers	2,900,000
Girvan	235,000
Glasgow	3,000,000
Glasgow	2,500,000
Glasgow	2,250,000
Glossop	340,000
Gloucester	800,000
Gloucester	1,000,000
Gosport	200,000
Gosport	225,000
Göteborg	300,000
Göteborg	600,000
Graudenz	200,000
Grays	250,000
Grays	400,000
Groningen, Holland	500,000
Guest Keen & Piggotts, Ltd.	1,936,000
Guildford	300,000
Guildford	200,000
Guildford	350,000
Guildford	1,100,000
Guildford	150,000
Haarlem	850,000
Hamburg	1,750,000
Hampton Court	500,000
Hampton Court	600,000
Hampton Court	1,100,000
Hanley	800,000
Hanley	800,000
Hartlepool	750,000
Hartlepool	765,000
Haywards Heath	470,000
Hebden Bridge	200,000
Heidelberg	200,000
Hereford	525,000
Hertford	197,000
Hertford	244,000
Hessle	150,000
High Wycombe	752,000
Hilversum	850,000
Hinckley	250,000
Holyhead	197,000
Hong Kong	450,000
Hong Kong	450,000
Hornsey	1,000,000
Hornsey	1,000,000
Hornsey	750,000
Hornsey	750,000
Horsham	235,000
Hull	1,500,000
Hull	1,000,000
Hull	1,600,000
Innsbruck	200,000
Ipswich	750,000
Ipswich	1,250,000
Jersey	444,000
Kampen	350,000
Karlsbad	350,000
Kendal	329,000

	Cu. Ft. Daily
Kidsgrove	235,000
Kiel	1,000,000
Kiel	880,000
Kilmarnock	500,000
Kilmarnock	585,000
King's Lynn	197,000
Kirkintilloch	360,000
Kirkintilloch	827,000
Kolozsvar	100,000
Lancaster	500,000
Largs	235,000
Lausanne	250,000
Lausanne	385,000
Le Mans	420,000
Lea Bridge	350,000
Lea Bridge	350,000
Lea Bridge	400,000
Lea Bridge	1,000,000
Lea Bridge	1,500,000
Lea Bridge	1,530,000
Leamington	600,000
Leamington	525,000
Leatherhead	705,000
Leeds	1,500,000
Leeuwarden	400,000
Leiden	500,000
Leiden	575,000
Leigh	350,000
Lemberg	260,000
Lemberg	500,000
Letchworth	362,000
Letchworth	423,000
Liége	1,000,000
Liége	750,000
Lille	880,000
Lincoln	300,000
Lincoln	893,000
Liverpool	3,500,000
Liverpool	4,500,000
Liverpool	750,000
Liverpool	1,750,000
Liverpool	1,250,000
Liverpool	3,000,000
Liverpool	1,500,000
Liverpool	1,250,000
Liverpool	2,350,000
Long Eaton	430,000
Long Eaton	170,000
Longton	600,000
Louvain	800,000
Lubeck	400,000
Luton	400,000
Maastricht	200,000
Macclesfield	800,000
Magdeburg	1,400,000
Maidenhead	225,000
Maidenhead	225,000
Maidenhead	175,000
Maidenhead	175,000
Maidstone	500,000
Maidstone	500,000
Malines	500,000
Malines	575,000
Malmö	350,000
Malta	400,000
Manchester	3,500,000
Manchester	3,500,000
Manchester	1,500,000
Mansfield	333,000
Mansfield	493,000
Marlborough	100,000
Mayence	1,700,000
Melbourne	5,000,000
Merthyr Tydfil	300,000
Merthyr Tydfil	200,000
Middlesbrough	1,250,000
Middlesbrough	750,000
Middlesbrough	900,000
M/M. Woolston	9,000,000
Monaco	275,000
Monaco	618,000
Mons	500,000
Montevideo	1,222,000
Morecambe	333,000
Moscow	1,000,000
Munich	1,400,000
Namur	175,000
Narbonne	350,000
Nelson	400,000
Neuss	140,000
Newbury	250,000
Newcastle	2,500,000
Newcastle, N.S.W.	500,000
Newport Pagnell	188,000
Nice	600,000
Nictheroy	250,000
N. Middlesex	150,000
N. Middlesex	200,000
N. Middlesex	75,000
N. Middlesex	650,000
N. Middlesex	650,000
N. Middlesex	1,000,000
Northfleet	235,000
North Sydney	500,000
North Sydney	500,000
Norwich	1,000,000
Norwich	300,000
Norwich	500,000
Norwich	1,500,000
Nottingham	1,000,000
Nottingham	1,000,000
Nuneaton	125,000
Oberhausen	175,000
Oldbury	500,000
Oldenburg	200,000

	Cu. Ft. Daily
Ormskirk	170,000
Ostend	100,000
Ostend	200,000
" Zandvoorde	700,000
Palermo	968,000
Palermo	850,000
Paris:	
Clichy	4,000,000
Ivry	1,576,000
Landy	6,000,000
Landy	6,000,000
La Villette	4,000,000
La Villette	2,000,000
St. Mandé	1,570,000
Paris-Plage	125,000
Pau	550,000
Pembroke	240,000
Perigueux	350,000
Perth, W.A.	125,000
Piggott & Co.	1,500,000
Plymouth	2,000,000
Poitiers	350,000
Pontypool	120,000
Port Elizabeth	400,000
Portsmouth	1,000,000
Portsmouth	2,000,000
Portsmouth	800,000
Portsmouth	2,000,000
Posen	450,000
Posen	700,000
Prague	140,000
Preston	1,400,000
Ramsgate	430,000
Reading	1,000,000
Reading	1,000,000
Reading	600,000
Redditch	500,000
Redhill	275,000
Redhill	300,000
Redhill	1,100,000
Reichenberg	200,000
Reichenberg	200,000
Reval	350,000
Rhymney	175,000
Rhymney	250,000
Riddings	258,000
Ripley	120,000
Rochester	2,200,000
Rochester	2,800,000
Romford	300,000
Romford	350,000
Rotterdam	850,000
Rotterdam	1,500,000
Rotterdam	750,000
Rotterdam	750,000
Rotterdam	600,000
Rotterdam	2,000,000
Royston (Yorks.)	250,000
Rugby	1,000,000
Rushden	425,000
Rushden	517,000
Saffron Walden	235,000
St. Albans	700,000
St. Andrews	210,000
St. Andrews	409,000
St. Gallen	225,000
St. Gallen	225,000
Ste. Ch. Gr. Faroisse	1,320,000
Stä. Pr. Ch. Kuhlmann	1,270,000
Stä. Tubes Meuse	545,000
San Paulo	700,000
Scarborough	800,000
Scarborough	200,000
Scarborough	350,000
Scarborough	1,300,000
Scarborough	1,350,000
Seaford	200,000
Shanghai	225,000
Shanghai	225,000
Shanghai	1,600,000
Shanklin	259,000
Sheerness	200,000
Sheerness	180,000
Sheerness	200,000
Sheffield	1,530,000
" Steel Prods.	5,000,000
Shrewsbury	300,000
Sidmouth	225,000
Sittingbourne	259,000
Southampton	800,000
Southampton	500,000
Southampton	600,000
Southampton	100,000
Southampton	1,000,000
Southend	1,250,000
Southend	900,000
Southend	900,000
Southgate	400,000
Southgate	500,000
Southgate	800,000
Southgate	500,000
Southport	750,000
Southport	900,000
Southport	900,000
Southport	450,000
South Shields	650,000
South Shields	1,250,000
Stafford	500,000
Stettin	880,000
Stirling	400,000
Stockholm	1,500,000
Stockholm	1,750,000
Stockport	600,000
Stockport	600,000
Stockport	400,000
Stockport	400,000
Stourbridge	500,000
Sunderland	2,250,000
Sunderland	300,000
Sutton	1,269,000
Swansea	750,000
Swansea	1,000,000
Swansea	450,000
Swansea	1,250,000
Swansea	2,000,000
Swindon	300,000
Swindon	450,000
Swindon	400,000
Sydney	1,000,000
Sydney	1,000,000
Sydney	1,000,000
Sydney	1,000,000
Sydney	8,250,000
Taunton	225,000
Taunton	350,000
Tawe Valley	275,000
Teignmouth	200,000
The Hague	1,000,000
The Hague	500,000
The Hague	1,750,000
The Hague	1,500,000
The Hague	775,000
The Hague	1,500,000
Tilburg	400,000
Tirlemont	120,000
Tokyo	2,000,000
Torquay	350,000
Torquay	350,000
Torquay	320,000
Tottenham	750,000
Tottenham	750,000
Tottenham	350,000
Tottenham	1,000,000
Tottenham	1,000,000
Tottenham	1,250,000
Tottenham	2,500,000
Tottenham	1,000,000
Tottenham	500,000
Tottenham	1,000,000
Toulouse	1,800,000
Toulouse Natl. Wks.	2,400,000
Toulouse Natl. Wks.	6,200,000
Tournai	700,000
Tours	550,000
Trowbridge	250,000
Tunbridge Wells	1,000,000
Tunbridge Wells	1,000,000
Tunis	175,000
Tynemouth	1,100,000
Tynemouth	1,100,000
Ulm	400,000
Utrecht	1,000,000
Utrecht	1,000,000
Uxbridge	752,000
Vancouver	3,800,000
Verviers	1,000,000
Vienna	3,500,000
Vienna	2,500,000
Walsall	750,000
Walsall	375,000
Waltham	400,000
Waltham	140,000
Wandsbek	125,000
Wandsworth	1,800,000
Wandsworth	4,230,000
Wanganui, N.Z.	376,000
Ware	150,000
Ware	282,000
Warwick	125,000
Wasmuel	500,000
Watford	300,000
Watford	350,000
Watford	400,000
Wath	430,000
Weimar	100,000
Wellingborough	525,000
Wellingborough	525,000
Wellington, N.Z.	350,000
West Bromwich	550,000
Westgate	250,000
Weston-Mare	350,000
Weston-Mare	350,000
Weston-Mare	150,000
Weston-Mare	400,000
Wexford	100,000
Weymouth	400,000
Weymouth	100,000
Weymouth	658,000
Whitstable	423,000
Widnes	500,000
Wiesbaden	850,000
Winchester	225,000
Winchester	125,000
Winchester	410,000
Winchester	400,000
Woking	400,000
Wolverhampton	1,500,000
Wolverhampton	1,000,000
Wolverhampton	250,000
Wolverhampton	400,000
Worthing	525,000
Yarmouth	500,000
Yarmouth	125,000
Yeovil	340,000
Zwolle	200,000
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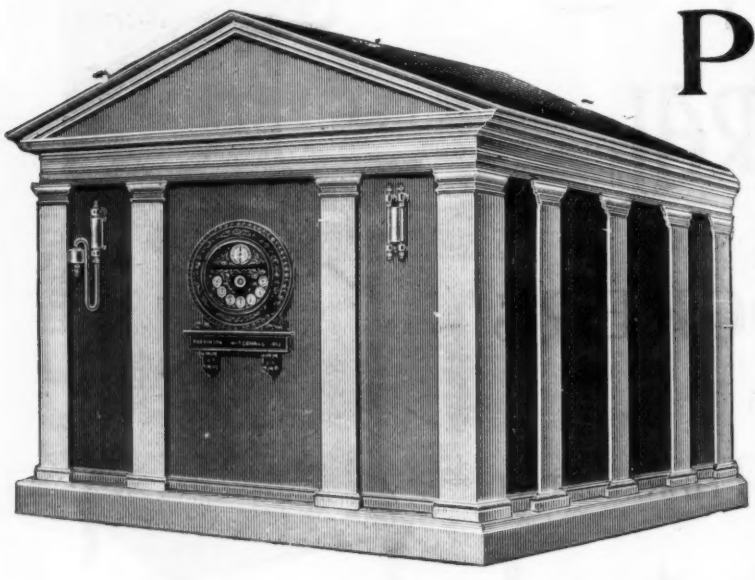

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